

# GLOBAL JOURNAL

OF MEDICAL RESEARCH: K

Interdisciplinary

Prognosis of Urinary Bladder

Anti-Aging Signaling Molecule

Highlights

Practices of Waste Segregation

Factors Determining Knowledge

Discovering Thoughts, Inventing Future

VOLUME 18    ISSUE 4    VERSION 1.0



GLOBAL JOURNAL OF MEDICAL RESEARCH: K  
INTERDISCIPLINARY

---



GLOBAL JOURNAL OF MEDICAL RESEARCH: K  
INTERDISCIPLINARY

VOLUME 18 ISSUE 4 (VER. 1.0)

---

OPEN ASSOCIATION OF RESEARCH SOCIETY

© Global Journal of Medical Research. 2018.

All rights reserved.

This is a special issue published in version 1.0 of "Global Journal of Medical Research." By Global Journals Inc.

All articles are open access articles distributed under "Global Journal of Medical Research"

Reading License, which permits restricted use. Entire contents are copyright by of "Global Journal of Medical Research" unless otherwise noted on specific articles.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without written permission.

The opinions and statements made in this book are those of the authors concerned. Ultraculture has not verified and neither confirms nor denies any of the foregoing and no warranty or fitness is implied.

Engage with the contents herein at your own risk.

The use of this journal, and the terms and conditions for our providing information, is governed by our Disclaimer, Terms and Conditions and Privacy Policy given on our website <http://globaljournals.us/terms-and-condition/menu-id-1463/>

By referring / using / reading / any type of association / referencing this journal, this signifies and you acknowledge that you have read them and that you accept and will be bound by the terms thereof.

All information, journals, this journal, activities undertaken, materials, services and our website, terms and conditions, privacy policy, and this journal is subject to change anytime without any prior notice.

Incorporation No.: 0423089  
License No.: 42125/022010/1186  
Registration No.: 430374  
Import-Export Code: 1109007027  
Employer Identification Number (EIN):  
USA Tax ID: 98-0673427

## Global Journals Inc.

(A Delaware USA Incorporation with "Good Standing"; Reg. Number: 0423089)

Sponsors: Open Association of Research Society

Open Scientific Standards

### Publisher's Headquarters office

Global Journals® Headquarters  
945th Concord Streets,  
Framingham Massachusetts Pin: 01701,  
United States of America

USA Toll Free: +001-888-839-7392

USA Toll Free Fax: +001-888-839-7392

### Offset Typesetting

Global Journals Incorporated  
2nd, Lansdowne, Lansdowne Rd., Croydon-Surrey,  
Pin: CR9 2ER, United Kingdom

### Packaging & Continental Dispatching

Global Journals Pvt Ltd  
E-3130 Sudama Nagar, Near Gopur Square,  
Indore, M.P., Pin:452009, India

### Find a correspondence nodal officer near you

To find nodal officer of your country, please  
email us at [local@globaljournals.org](mailto:local@globaljournals.org)

### eContacts

Press Inquiries: [press@globaljournals.org](mailto:press@globaljournals.org)  
Investor Inquiries: [investors@globaljournals.org](mailto:investors@globaljournals.org)  
Technical Support: [technology@globaljournals.org](mailto:technology@globaljournals.org)  
Media & Releases: [media@globaljournals.org](mailto:media@globaljournals.org)

### Pricing (Excluding Air Parcel Charges):

Yearly Subscription (Personal & Institutional)  
250 USD (B/W) & 350 USD (Color)

# EDITORIAL BOARD

GLOBAL JOURNAL OF MEDICAL RESEARCH

## *Dr. Apostolos Ch. Zarros*

DM, Degree (Ptychio) holder in Medicine,  
National and Kapodistrian University of Athens  
MRes, Master of Research in Molecular Functions in  
Disease, University of Glasgow FRNS, Fellow, Royal  
Numismatic Society Member, European Society for  
Neurochemistry Member, Royal Institute of Philosophy  
Scotland, United Kingdom

## *Dr. Alfio Ferlito*

Professor Department of Surgical Sciences  
University of Udine School of Medicine, Italy

## *Dr. Jixin Zhong*

Department of Medicine, Affiliated Hospital of  
Guangdong Medical College, Zhanjiang, China, Davis  
Heart and Lung Research Institute, The Ohio State  
University, Columbus, OH 43210, US

## *Rama Rao Ganga*

MBBS  
MS (University of Health Sciences, Vijayawada, India)  
MRCS (Royal College of Surgeons of Edinburgh, UK)  
United States

## *Dr. Izzet Yavuz*

MSc, Ph.D., D Ped Dent.  
Associate Professor, Pediatric Dentistry Faculty of  
Dentistry, University of Dicle Diyarbakir, Turkey

## *Sanguansak Rerksuppaphol*

Department of Pediatrics Faculty of Medicine  
Srinakharinwirot University  
NakornNayok, Thailand

## *Dr. William Chi-shing Cho*

Ph.D.,  
Department of Clinical Oncology  
Queen Elizabeth Hospital  
Hong Kong

## *Dr. Michael Wink*

Ph.D., Technical University Braunschweig, Germany  
Head of Department Institute of Pharmacy and Molecular  
Biotechnology, Heidelberg University, Germany

## *Dr. Pejic Ana*

Assistant Medical Faculty Department of Periodontology  
and Oral Medicine University of Nis, Serbia

## *Dr. Ivandro Soares Monteiro*

M.Sc., Ph.D. in Psychology Clinic, Professor University of  
Minho, Portugal

## *Dr. Sanjay Dixit, M.D.*

Director, EP Laboratories, Philadelphia VA Medical Center  
Cardiovascular Medicine - Cardiac Arrhythmia  
Univ of Penn School of Medicine  
Web: [pennmedicine.org/wagform/MainPage.aspx?](http://pennmedicine.org/wagform/MainPage.aspx?)

## *Antonio Simone Laganà*

M.D. Unit of Gynecology and Obstetrics  
Department of Human Pathology in Adulthood and  
Childhood "G. Barresi" University of Messina, Italy

*Dr. Han-Xiang Deng*

MD., Ph.D  
Associate Professor and Research Department  
Division of Neuromuscular Medicine  
Davee Department of Neurology and Clinical  
Neurosciences  
Northwestern University Feinberg School of Medicine  
Web: [neurology.northwestern.edu/faculty/deng.html](http://neurology.northwestern.edu/faculty/deng.html)

*Dr. Roberto Sanchez*

Associate Professor  
Department of Structural and Chemical Biology  
Mount Sinai School of Medicine  
Ph.D., The Rockefeller University  
Web: [mountsinai.org/](http://mountsinai.org/)

*Dr. Feng Feng*

Boston University  
Microbiology  
72 East Concord Street R702  
Duke University  
United States of America

*Dr. Hrushikesh Aphale*

MDS- Orthodontics and Dentofacial Orthopedics.  
Fellow- World Federation of Orthodontist, USA.

*Gaurav Singhal*

Master of Tropical Veterinary Sciences, currently  
pursuing Ph.D in Medicine

*Dr. Pina C. Sanelli*

Associate Professor of Radiology  
Associate Professor of Public Health  
Weill Cornell Medical College  
Associate Attending Radiologist  
NewYork-Presbyterian Hospital  
MRI, MRA, CT, and CTA  
Neuroradiology and Diagnostic Radiology  
M.D., State University of New York at Buffalo,  
School of Medicine and Biomedical Sciences  
Web: [weillcornell.org/pinasanelli/](http://weillcornell.org/pinasanelli/)

*Dr. Michael R. Rudnick*

M.D., FACP  
Associate Professor of Medicine  
Chief, Renal Electrolyte and Hypertension Division (PMC)  
Penn Medicine, University of Pennsylvania  
Presbyterian Medical Center, Philadelphia  
Nephrology and Internal Medicine  
Certified by the American Board of Internal Medicine  
Web: [uphs.upenn.edu/](http://uphs.upenn.edu/)

*Dr. Seung-Yup Ku*

M.D., Ph.D., Seoul National University Medical College,  
Seoul, Korea Department of Obstetrics and Gynecology  
Seoul National University Hospital, Seoul, Korea

*Santhosh Kumar*

Reader, Department of Periodontology,  
Manipal University, Manipal

*Dr. Aarti Garg*

Bachelor of Dental Surgery (B.D.S.) M.D.S. in Pedodontics  
and Preventive Dentistr Pursuing Phd in Dentistry

*Sabreena Safuan*

Ph.D (Pathology) MSc (Molecular Pathology and Toxicology) BSc (Biomedicine)

*Getahun Asebe*

Veterinary medicine, Infectious diseases, Veterinary Public health, Animal Science

*Dr. Suraj Agarwal*

Bachelor of dental Surgery Master of dental Surgery in Oromaxillofacial Radiology.  
Diploma in Forensic Science & Oodontology

*Osama Alali*

PhD in Orthodontics, Department of Orthodontics, School of Dentistry, University of Damascus. Damascus, Syria. 2013 Masters Degree in Orthodontics.

*Prabudh Goel*

MCh (Pediatric Surgery, Gold Medalist), FISPU, FICS-IS

*Raouf Hajji*

MD, Specialty Assistant Professor in Internal Medicine

*Surekha Damineni*

Ph.D with Post Doctoral in Cancer Genetics

*Arundhati Biswas*

MBBS, MS (General Surgery), FCPS, MCh, DNB (Neurosurgery)

*Rui Pedro Pereira de Almeida*

Ph.D Student in Health Sciences program, MSc in Quality Management in Healthcare Facilities

*Dr. Sunanda Sharma*

B.V.Sc.& AH, M.V.Sc (Animal Reproduction, Obstetrics & gynaecology),  
Ph.D.(Animal Reproduction, Obstetrics & gynaecology)

*Shahanawaz SD*

Master of Physiotherapy in Neurology PhD- Pursuing in Neuro Physiotherapy Master of Physiotherapy in Hospital Management

*Dr. Shabana Naz Shah*

PhD. in Pharmaceutical Chemistry

*Vaishnavi V.K Vedam*

Master of dental surgery oral pathology

*Tariq Aziz*

PhD Biotechnology in Progress

## CONTENTS OF THE ISSUE

---

- i. Copyright Notice
- ii. Editorial Board Members
- iii. Chief Author and Dean
- iv. Contents of the Issue
  
1. Knowledge, Attitude, and Practices of Waste Segregation at Kapsabet County Referral Hospital, Nandi County, Kenya. **1-5**
2. Prognosis of Urinary Bladder TCC in Young Adults: A Single Center Experience. **7-15**
3. Factors Determining Knowledge of HIV/AIDS among Bangladeshi Women. **17-22**
4. A New Anti-Aging Signaling Molecule with an Absorption Peak around 264 nm along with Resveratrol Extracted from Sprouted Black Gram, Green Gram, or Kidney Bean Seeds by Applying Pulsed Heating. **23-26**
5. Silent Lacunary Brain Infarctions Associated with Left Ventricular Noncompaction and Idiopathic Epilepsy: A Case Report. **27-30**
6. Drug Prescribing and Dispensing Practice in Public Hospitals in Tigry Regional State, Ethiopia. **31-42**
  
- v. Fellows
- vi. Auxiliary Memberships
- vii. Preferred Author Guidelines
- viii. Index





# Knowledge, Attitude, and Practices of Waste Segregation at Kapsabet County Referral Hospital, Nandi County, Kenya

By Justinah Maluni, Benard Omambia, Stephen W Muhindi & Mutuku Chrispus Ngule

*University of Eastern Africa*

**Abstract- Background:** Poor management of clinical waste poses a public health risk (Nema et al., 2011). Hence, appropriate Clinical Waste Management (CWM) is a crucial issue for maintaining human and public health and can be achieved through effective and efficient wastes segregation (Nema et al., 2011). The key to effective management of medical waste is segregation (separation) of the waste (Rao et. al., 2004).

**Objectives:** To assess the knowledge, attitude and practices on medical waste segregation.

**Methods:** The study was done in November 2015 using quantitative descriptive design. The data from 139 healthcare workers at Kapsabet County Referral Hospital from Nandi County, Kenya was collected through questionnaires and analyzed with SPSS version 20. The knowledge, attitude and practices were assessed through a census and the data was thereafter interpreted at 95% confidence interval.

**Results:** 32% of the respondents did not know what waste segregation was, 35% said that waste segregation should not be done at the generation point an indicator of poor knowledge on waste segregation. 94% of the respondents believed bin emptying was the responsibility of the cleaners an indicator of a negative attitude towards waste segregation.

**Keywords:** *medical waste, Waste segregation, knowledge, attitude, practices, medical waste management.*

**GJMR-K Classification:** *NLMC Code: WY 108*



*Strictly as per the compliance and regulations of:*



# Knowledge, Attitude, and Practices of Waste Segregation at Kapsabet County Referral Hospital, Nandi County, Kenya

Justinah Maluni<sup>α</sup>, Benard Omambia<sup>α</sup>, Stephen W Muhindi<sup>σ</sup> & Mutuku Chrispus Ngule<sup>ρ</sup>

**Abstract- Background:** Poor management of clinical waste poses a public health risk (Nema *et al.*, 2011). Hence, appropriate Clinical Waste Management (CWM) is a crucial issue for maintaining human and public health and can be achieved through effective and efficient wastes segregation (Nema *et al.*, 2011). The key to effective management of medical waste is segregation (separation) of the waste (Rao *et al.*, 2004).

**Objectives:** To assess the knowledge, attitude and practices on medical waste segregation.

**Methods:** The study was done in November 2015 using quantitative descriptive design. The data from 139 healthcare workers at Kapsabet County Referral Hospital from Nandi County, Kenya was collected through questionnaires and analyzed with SPSS version 20. The knowledge, attitude and practices were assessed through a census and the data was thereafter interpreted at 95% confidence interval.

**Results:** 32% of the respondents did not know what waste segregation was, 35% said that waste segregation should not be done at the generation point an indicator of poor knowledge on waste segregation. 94% of the respondents believed bin emptying was the responsibility of the cleaners an indicator of a negative attitude towards waste segregation.

**Conclusion:** It is important to note that, knowledge and attitude are key determinants of waste segregation practices.

**Recommendations:** A study should be done on the challenges facing proper waste segregation. Public health policy intervention is required to strictly monitor waste management in health sectors.

**Keywords:** *medical waste, Waste segregation, knowledge, attitude, practices, medical waste management.*

## I. INTRODUCTION

Medical waste (MW) or Biomedical waste has been defined as any solid waste generated in the diagnosis, treatment or the immunization of human beings and animals while in medical research, this includes the production or testing of biological materials from all types of healthcare institutions,

including hospitals, clinics, doctor's offices (including dental and veterinary) and medical laboratories and in medical research, its wastes in production of vaccines or other substances produced from living organisms (WHO, 1999, 2005). Inadequate and inappropriate knowledge of handling of healthcare waste may have serious health consequences and a significant impact on the environment as well (Mathur *et al.*, 2014). Consequently, hazards of poor management of biomedical waste have aroused the concern world over, in its far-reaching effects on human health and the environment (WHO, 2011). Poor management of clinical waste poses a public health risk (Nema *et al.*, 2011).

According to WHO report, around 85% of the hospital wastes are non-hazardous, 10% are infective [hence, hazardous], and remaining 5% are non-infectious but hazardous [chemical, pharmaceutical and radioactive] (Manoranjini, 2014). A study in Tanzania (Manyele & Lyasenga, 2010) reported that segregation is not perfectly performed, despite the availability of specific containers for waste collection. Moreover, reports have shown that poor segregation is brought to naught by highly inefficient waste transport which is done mainly using wheelbarrows (USAID-Kenya, 2012)

A study done in Kenya by the National Health Care Waste Management plan, 2008-2012, shows that Kenya is still way below the WHO recommended standards, where 80% of waste should be non-infectious and can be recommended to join the municipal waste stream, while 20% is the infectious wastes that require special waste treatment methods. Segregation is not practiced in hospitals by health staff due to lack of training. (Kumar *et al.*, 2015). A study done in Bangladesh showed that questions on knowledge about color coded bins collecting waste, 67 (53.6%) could not give any correct answer and only 58 (46.4%) gave the correct answer (Uddin, Islam & Yesmin, 2014)

Studies in Tanzania (Manyele & Lyasenga, 2010) and Kenya (Kei & Njagi, 2013) have reported that segregation is not perfectly performed, despite the availability of specific containers for waste collection. A study done in Kenya by Kei and Njagi (2013), in public hospitals such as Kenyatta National Hospital (KNH) and Moi Teaching and Referral hospital showed that waste segregation on infectious, pathological, sharps and

Author <sup>α</sup>: University of Eastern Africa, Baraton; Department of Public Health, P.O BOX 2500-30100, Eldoret, Kenya.

Author <sup>σ</sup>: Youngstown State University, Department of Biological Sciences, University Plaza, Youngstown, OH 44555, USA.  
e-mail: Muhindi\_stephen@yahoo.com

Author <sup>ρ</sup>: Magbio Genomics Africa, P.O BOX 19535-00200, Nairobi, Kenya.

chemical waste was done unsatisfactorily. Moreover, these being referral hospitals in Kenya with unsatisfactory waste segregation methods where the level of knowledge on waste segregation is expected to be high there is need for further research in other health facilities in Kenya to determine the extent of the problem in other hospitals hence there is need for a research to assess the knowledge, attitude and practice on waste segregation among health care workers in Kapsabet County referral hospital.

## II. METHODOLOGY

A census study was done at Kapsabet county referral Hospital where all the health workers were issued with a structured closed-ended questionnaire. The questionnaire had questions on knowledge, attitude and practices of medical waste segregation.

All the health workers and cleaners present during the process of data collection were included in

the study. The health workers and cleaners absent during the data collection process and those who did not consent were excluded from the study. Ethical approval was done by the institutional research ethics committee of the University of Eastern Africa, Baraton, (REC: UEAB/21/10/2015) the hospital administrator of Kapsabet County Referral Hospital (Ref; R.I/VOL1/15). The data was collected in November 2015. All the health workers who consented and were willing to participate in the study filled the questionnaires form. The data was coded, entered and analyzed using SPSS Version 20 and excel program. Inferential analysis was done using chi-square test, spearman's correlation, Pearson's correlation and Multiple Linear Regression with a 95% Confidence Interval, and p-value of  $p \leq 0.05$  was used to interpret the data. (Oso & Onen, 2005).

## III. RESULTS

### Knowledge on waste segregation

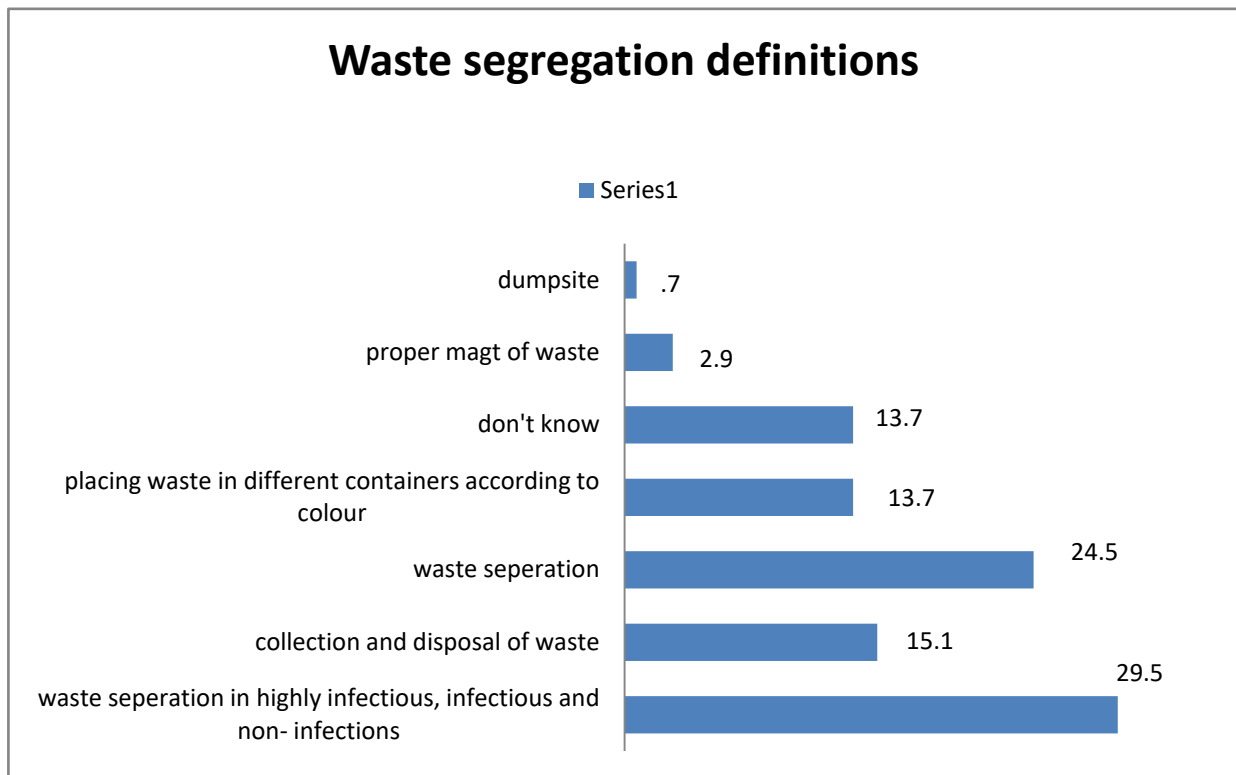


Figure 1: A graph showing definitions of waste segregation by health care workers

Table 1: A table showing results of when waste segregation should be done

Statement	True	False	Don't know
Waste should be segregated during Transport	15%	78%	5%
Waste should be segregated during disposal	28%	65%	7%
Waste should be segregated during generation	72%	21%	7%
Waste should be segregated at collection points	46%	48%	6%

**Table 2:** Chi-Square tests done to find out the relationship between knowledge (independent) and Practices (Dependent)

Variables	Value	P-Value
Waste food disposed in which bin (Dependent)	48.281*	0.000
Waste segregation generation point(independent)		

**Table 3:** A table showing results of Spearman’s correlation on attitude (independent) and Practices (dependent) on waste segregation and Chi-square test on knowledge and practices on waste segregation

Variables	Value	P-Value
Bin liners provision (independent)	26.429 <sup>a</sup>	0.000
Disposal of used gloves (dependent)		
Provision of sharps box (independent)	14.763 <sup>a</sup>	0.022
Disposal of branulars (dependent)		
Waste segregation is cleaners responsibility (independent)	0.226** (Correlation Coefficient)	0.007
segregate sharps only and mix all other wastes (dependent)		
Waste segregation increases waste management cost (Independent)	0.240**	0.004
Waste segregation reduces the quality of life (dependent)		

\*\*\* - significant values

#### IV. DISCUSSION

The findings indicate that, 32% of respondents had no idea of what waste segregation is, this is closely related to a study done by Abdullah & Al-Mukhtar, (2013) whose study had 29.8% of the respondents indicating that they had no idea about how the process of waste segregation is done hence the need of informing the whole medical staff about the medical waste management plan applied in the hospitals.

An average of 35% of the respondents said that waste segregation should not be done at the generation point. This contradicts with a study done by WHO, (2011) which showed that it is essential that all medical waste materials are segregated at the point of generation and Chartier *et al.*, (2012), who stated that segregation at source is recommended as it makes it easier to prevent spread of infection, helps in making it easier to choose among the options of disposal, and can reduce the load on the waste treatment system and prevent injuries. The study went further to show whether knowledge really influenced the practices on waste segregation and based on the P value (P=0.000) knowledge is related to practice (table 2). This indicates that the level of knowledge influences waste segregation practices.

Provision of bin liners and safety boxes is key aspect in segregation of medical wastes. However, according to the findings 14% and 12% of the respondents indicated they were not provided with bin liners and safety boxes respectively. This contravenes with the WHO, that hospitals should provide plastic bags for infectious waste Pruss *et al.*, (1999). It also contravenes Sapkota *et al.*, (2014), who stated that infectious waste bags which are colored or labeled in accordance with the policies or regulations should be provided as it helps the system of segregation of waste

at source, into suitable color-coded high-density polythene bags and bins, for the easy identification and segregation of infectious and non-infectious wastes should be used. It also contravenes a study by Acharya & Singh, (2000), which showed that sharps should be collected in puncture-proof containers. Lack of bin liners and safety boxes might be a contributing factor to poor waste segregation because observations done by the researcher before the study at Kapsabet County Referral Hospital showed that there were syringes along the walk ways and the general waste and infectious waste were disposed together in the dumpsite. A Chi-Square test done shows that there is a relationship between provision of bin liners and sharps box and waste segregation practices with a P-value of 0.000 and 0.022 respectively. This illustrates that provision of safety boxes and the color-coded liners can help improve the practices of waste segregation.

According to the findings, majority of the respondents (94%) indicated that bin emptying was the responsibility of the cleaner. This might affect the waste segregation practices. According to Idowu & Alo, (2010), the absence of effective waste segregation is influenced by poor control of waste disposal by those in charge especially the health workers who leave every task of waste disposal to the cleaners. According to Spearman’s Rho on test done, there is small to moderate positive correlation (0.226) between waste disposal perception and the practices (p<=0.007). This shows that a change of attitude towards bin emptying responsibility can impact the practices positively.

Based on the findings, >20% of the respondents indicated that they placed waste in the wrong bins. This indicates that the practice of waste segregation within the hospitals is not done according to the guidelines. This contravenes the MOH, (2008), which shows that segregation of health care waste (HCW) should be done according to infectious or clinical

waste (hazardous waste), Non-infectious or general waste, highly infectious waste, and sharps waste. The color codes for HCW as recommended by National Environmental Management Authority (NEMA) are; yellow for infectious and sharps waste, black for non-infectious and the WHO recommends red for pathological and/or highly infectious waste.

Findings show that, majority of the respondents (89%) indicated that waste segregation helps control environmental pollution, waste segregation reduced hospitals acquired infections, waste segregation reduces the death /diseases due to repackaging, waste segregation reduces the incidence of occupational health hazards, waste segregation reduces the waste management cost, and waste segregation improves the image of health facility. This agrees with WHO, (2011), that poor management of health care waste potentially exposes health care workers, waste handlers, patients and the community at large to infection, toxic effects and injuries, and risks polluting the environment. Improper medical waste management causes environmental pollution, unpleasant smell, and may lead to transmission of diseases (Coker & Sridhar, 2010; Yitayel, Tamrat & Adane, 2012). However, a 44% which indicated that waste segregation increases incidence of occupational health risks, 24% indicated that waste segregation increases waste management cost, 21% indicated that waste segregation reduces the quality of life and this shows that there is a negative attitude among some of the health workers towards waste segregation which might affect their practices. According to a Spearman's Rho on test done, there is moderate positive correlation (0.240) between attitude and practices ( $P=0.004$ ) (table 3). Therefore, a change in attitude on waste segregation may impact the practices of waste segregation positively.

According to the findings, 26% of the respondents agreed that waste segregation is the cleaner's responsibility; this shows that there is a negative attitude towards waste segregation. The perception that waste segregation is the cleaner's responsibility might be a contributing factor to poor waste segregation. This concurs to a study by Madhukumar & Ramesh, (2014), that waste handling and disposal is often considered only the job of cleaning workers. Based on the statistical test there is a small to moderate correlation (0.226) between the attitude and practices ( $P= 0.007$ ) (table 3). This indicates that a change in the attitude of the responsibility of waste segregation can improve the practices of waste segregation.

## V. CONCLUSIONS

The study investigated knowledge, attitude and practices on waste segregation among health workers at Kapsabet County Referral Hospital. It was intended to

assess the knowledge, attitude and practices on waste segregation among health workers at Kapsabet County Referral Hospital. This was in relation to improper waste segregation practices observed at the hospital before the study which showed that infectious waste and non-infectious waste were disposed together in a dumpsite. The study specifically sought to find out if there was a relationship between knowledge, attitude and practices on waste segregation. The study established that knowledge and attitude on waste segregation affects the practices of waste segregation. In view of the findings, the study concludes that it is important to note that knowledge and attitude are key determinants of waste segregation practices. Ideal knowledge and positive attitude towards waste segregation are not yet to perfection and as a result, there are poor waste segregation practices.

## VI. RECOMMENDATIONS

With focus on the findings and the supportive literature review the study recommends the following:

- The health workers in Kapsabet county referral hospitals should be trained more on waste segregation practices and the impacts of improper waste segregation to their health, the community and the environment at large.
- The public health officer in charge of sanitation should ensure that continuous training and strict supervision should be made compulsory for all healthcare personnel working in Kapsabet County Referral Hospital.
- The medical staff should also be informed that bin emptying is a responsibility of every person and not only the cleaners because this encourages improper waste segregation
- The whole medical staff of Kapsabet county referral hospital should be informed on the best methods of medical waste separation/segregation

### *Recommendations for further study*

- A further study should be carried out on the factors contributing to improper waste segregation.
- A study should be done in the private hospitals within Nandi County to determine their practices in waste segregation
- A study should be done on the challenges facing proper waste segregation.

## VII. DECLARATIONS

### a) *Ethics approval and consent to participate*

This study commenced after ethical approval had been received from *the institutional Research Ethics Committee of the University of Eastern Africa, Baraton, (REC: UEAB/21/10/2015) the hospital administrator of Kapsabet County Referral Hospital (Ref; R.I/VOL1/15).*

Informed consent was obtained from all participants. The nature, purpose, and procedure of the study together with the time commitment required were explained to each participant on an information sheet. Participants were made aware that they were at liberty to refuse to answer any questions or drop out of the study at any time and that it would not affect them. Consent was then obtained from each participant in the study where they appended their signatures. All participants were assured that their responses would be treated with utmost confidentiality.

The study was conducted in the participants own environment. There was no threat of potential risk since no drugs or chemicals that were administered and handled. Participants would benefit from the study since interventions on improvement of waste segregation was to be put in place.

b) *Conflicts of interest*

The authors declare that they have no competing interests.

c) *Authors' contributions*

JM and BM conceived, designed and drafted manuscript. All authors read and approved the final manuscript. The corresponding author had full access to the study data and had final responsibility for the decision to submit manuscript for the publication.

d) *Disclaimer*

The findings and conclusions presented in this manuscript are for the authors and do not necessarily reflect the official position of University of Eastern Africa, Baraton. The corresponding author had full access to the study data and had final responsibility for the decision to submit for the publication.

### ACKNOWLEDGEMENTS

We are grateful to the health workers of Kapsabet County Referral Hospital for their participation in this study and to Madam Asenath Barongo for instilling research knowledge.

### REFERENCES RÉFÉRENCES REFERENCIAS

- Acharya, D. B., & Singh, M. (2000). *The Book of Hospital Waste Management*. New Delhi: Minerva Press.
- Chartier, Y., Emmanuel, J., Pieper, U., Pruss, A., Rushbrook, P., and Stringer, R., (2014). *Safe management of wastes from healthcare activities*. Switzerland: 2nd Ed WHO Press.
- Coker, A., & Sridhar, M. K. (2010). Increase in healthcare facilities and rapid environmental degradation: A technological paradox in Nigeria's,. *African Journal of Environmental Science and Technology*, vol. 4(9), pp. 577 - 585.
- Idowu, I., & Alo, B. (2010). Clinical waste management practice in Nigeria and England. A comparative study. *Communications in Waste and Resource Management. Waste Management and Research*, Vol. 10: 17 -21.
- Kei, R. M., & Njagi, A. N. (2013). Management of Health - Care waste: A Case Study of Two National Teaching and Referral Hospitals in Kenya,. *Journal of Emerging Trends in Engineering and Applied Sciences (JETEAS)*, (ISSN: 2141 - 7016).
- Kumar, R., Samrongthong, R., & Shaikh, B. T. (2013). Knowledge, attitude and practices of health staff regarding infectious waste handling of tertiary care health facilities at metropolitan city of Pakistan. *Journal of Ayub Medical College, Abbottabad: JAMC*, 25(1-2), 109 - 112.
- Madhukumar, S., & Ramesh, G. (2014). Study about awareness and practices about health care waste management among hospital staff in a medical college hospital, Bangalore;. *International Journal of Basic Medical Science*, Vol:5, Issue 1.
- Mathur, V., Dwivedi, S., & Hassan, M. A. (2011). Knowledge, attitude, and practices about biomedical waste management among healthcare personnel: A cross-sectional study. *Indian Journal of Community Medicine*, 36: 143 - 145.
- MOH. (2008). *The National Health Care Waste Management Plan - 2008-2012*. Nairobi: Republic of Kenya.
- Nema, A., Pathak, A., Bajaj, P., Singh, H., & Kumar, S. (2011). A case study: biomedical waste management practices at city hospital in Himachal Pradesh. *Waste Management and Research*, 29(6), 669 - 673.
- Pruss, A., Giroult, E., & Rushbrook, P. (1999). *Safe Management of Waste from Health Care Activities*. Geneva, Switzerland: World Health Organization.
- Sapkota, B., Gupta, K. G., & Dhiraj, M. (2014). Impact of intervention on healthcare waste management practices in a tertiary care governmental hospital of Nepal. *BMC Public Health*, 14:1005.
- WHO. (1999). *Management of Wastes from Healthcare Activities*. Geneva: World Health Organization.
- WHO. (2005). *Management of Solid Health - Care waste at Primary Health - Care Centers; A Decision - Making Guide*. Geneva, Switzerland: WHO Document Production Services.
- WHO. (2011). *Health-care waste management*. Geneva: WHO.
- Yitayel, S., Tamrat, A., & Adane, M. (2012). Sharps injuries and exposure to blood and bloodstained fluids involving waste handlers. *Waste Management and Research*, vol. 30, pp. 1299 - 1305.
- Amin, M. E. (2003a). Overview of the methodology of research. A paper presented at a seminar on Overview of Educational research methodology for teachers of the School of Education, Makerere University, Kampala.



This page is intentionally left blank



GLOBAL JOURNAL OF MEDICAL RESEARCH: K  
INTERDISCIPLINARY

Volume 18 Issue 4 Version 1.0 Year 2018

Type: Double Blind Peer Reviewed International Research Journal

Publisher: Global Journals

Online ISSN: 2249-4618 & Print ISSN: 0975-5888

## Prognosis of Urinary Bladder TCC in Young Adults: A Single Center Experience

By Sasanka Kumar Barua, Puskal Kumar Bagchi, Yashasvi Singh, Saumar Jyoti Baruah, Rajeev T.P., Debanga Sarma, Mandeep Phukan & Manash Pratim Kashyap

*North Eastern Regional Institute of Management*

**Abstract- Introduction:** Bladder TCC is rare in young adults and occurs more commonly in elderly individuals. The incidence of TCC urinary bladder is found to be 1% - 2.4% among young adults less than 40 years of age. Younger population has incidence of only .1% - .4% (age less than 20 yrs). Present study aimed to compare the clinical behavior, pathologic characteristics and prognosis of TCC urinary bladder in population between  $\leq 30$  and 31-40 yrs.

**Methods:** A retrospective review of our records between Jan 2006 and Dec 2012 identified 71 patients with TCC bladder who were less than 40 years old. Clinical and pathological parameters of patients who were  $\leq 30$  years of age were compared with those of a series of patients between 31- 40 years of age during the same period.

**Results:** Multivariate logistic regression analysis revealed high tumor grade and multifocality as predominant predictors of tumor recurrence in young patients. A Significant difference was observed in the recurrence-free ( $p < .018$ ) and progression- free ( $p < 0.06$ ) survival rates between the two groups.

**Keywords:** TCC urinary bladder, recurrence, progression, grade, multifocality, smoking, recurrence- free survival, progression- free survival.

**GJMR-K Classification:** NLMC Code: WJ 303



*Strictly as per the compliance and regulations of:*



© 2018. Sasanka Kumar Barua, Puskal Kumar Bagchi, Yashasvi Singh, Saumar Jyoti Baruah, Rajeev T.P., Debanga Sarma, Mandeep Phukan & Manash Pratim Kashyap. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License (<http://creativecommons.org/licenses/by-nc/3.0/>), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.



# Prognosis of Urinary Bladder TCC in Young Adults: A Single Center Experience

## Urinary Bladder Cancer in Young Adults

Sasanka Kumar Barua <sup>α</sup>, Puskal Kumar Bagchi <sup>σ</sup>, Yashasvi Singh <sup>ρ</sup>, Saumar Jyoti Baruah <sup>ω</sup>, Rajeev T.P. <sup>¥</sup>, Debanga Sarma <sup>§</sup>, Mandeep Phukan <sup>χ</sup> & Manash Pratim Kashyap <sup>ν</sup>

**Abstract- Introduction:** Bladder TCC is rare in young adults and occurs more commonly in elderly individuals. The incidence of TCC urinary bladder is found to be 1% - 2.4% among young adults less than 40 years of age. Younger population has incidence of only .1% - .4% (age less than 20 yrs). Present study aimed to compare the clinical behavior, pathologic characteristics and prognosis of TCC urinary bladder in population between  $\leq 30$  and 31-40 yrs.

**Methods:** A retrospective review of our records between Jan 2006 and Dec 2012 identified 71 patients with TCC bladder who were less than 40 years old. Clinical and pathological parameters of patients who were  $\leq 30$  years of age were compared with those of a series of patients between 31- 40 years of age during the same period.

**Results:** Multivariate logistic regression analysis revealed high tumor grade and multifocality as predominant predictors of tumor recurrence in young patients. A Significant difference was observed in the recurrence-free ( $p < .018$ ) and progression- free ( $p < 0.06$ ) survival rates between the two groups.

**Conclusion:** We concluded that although the clinical stage distribution, natural history, and outcomes of bladder TCC in young adults are similar to those in their older counterparts, Clinicians must be aware that patients with higher-grade and multifocal tumors are more likely to experience tumor recurrence and grade progression.

**Keywords:** TCC urinary bladder, recurrence, progression, grade, multifocality, smoking, recurrence- free survival, progression- free survival.

### 1. INTRODUCTION

Transitional cell carcinoma (TCC) urinary bladder is the fourth most common neoplasm in men and eighth most common neoplasm in women in the

**Author  $\alpha$   $\sigma$ :** Associate Professor, Department of Urology, 3<sup>rd</sup> floor, GMCH complex, GMC hostel road, Bhangagarh, Guwahati, 781032, Assam, India. e-mails: sasankagmch@gmail.com, pusalkumarbagchi@rediffmail.com

**Author  $\rho$ :** M.Ch trainee, Department of Urology, 3<sup>rd</sup> floor, GMCH complex, GMC hostel road, Bhangagarh, Guwahati, 781032, Assam, India. e-mail: yashasvisingh075@gmail.com

**Author  $\omega$   $\chi$   $\chi$ :** Professor & Head, Department of Urology, 3<sup>rd</sup> floor, GMCH complex, GMC hostel road, Bhangagarh, Guwahati, 781032, Assam, India. e-mails: rajeevtpuro@gmail.com, debangasarma@gmail.com, mandeepphukan@gmail.com

**Author  $\nu$ :** Assistant Professor, North Eastern Regional Institute of Management, Padma Nath Sarmah Bhawan, Khanapara, Guwahati, 781022, Assam, India. e-mail: Mpk.stat@gmail.com

Western world. Urinary bladder cancer is rare in young Adults and occurs more commonly in elderly individuals. The median age of presentation for men is usually 69 yrs and for the female is 71 yrs respectively [1,2]. TCC urinary bladder incidence below the age of 40 years is 1% - 2.4% only. Younger population has incidence of only .1% - .4% (age less than 20 yrs) [3, 4]. Although the genomic nature and management of bladder cancer have been well researched, inconclusive reports exist about clinical pattern and prognosis for patients less than 40 years of age. Whether younger cases have a superior prognosis than their aged counterparts has long been a subject of contention; indeed, some reports projected similar patterns of clinical behavior and prognosis for TCC bladder in young and older patients, whereas other reports displayed lower rates of disease recurrence and progression, and superior outcome survival, in younger patients [5-8].

Among the probable risk scenarios expected in TCC bladder, tobacco consumption is most crucial and is responsible for 48% cases in males and 32% in females in the developed world [9]. Environmental factors in the form of occupational exposure, chemical and treatment exposure along with family history plays an important role in the etiopathogenesis of TCC bladder. In our analysis though majority of our patients were young tobacco consumers, we still noticed that a sizeable chunk did not have significant smoking exposure. The acute rise in these cases (NE India) in the past 2 decades bears testimony to the ever-increasing health hazards being faced by the population in this part of the world comprising of multiethnic population. An Indian study published data on patients diagnosed with TCC Urinary bladder and reported median age between 65–70 years. Moreover, there was a male preponderance (86.4% male vs. 13.6% female). Tobacco smoking (75% cases) revealed a strong relationship with TCC bladder which was quantity and duration dependent [9]. Another Indian study reported data collected from the Bombay Cancer Registry and found that bladder cancer was very uncommon in the first three decades of life [10]. Nonetheless, past 30 years of age, the incidence rates increase with age, in log-linear fashion, in both genders. The Indian

subcontinent data differ from the Western counterpart in two aspects. First, the contrast in the incidence of smoking among Indian men and women is much more distinguished (74% vs. 22%) than in the West. Second, the incidence of TCC bladder per se is much more cardinal in Indian men (8.9:1). The vast majority of bladder cancer in men versus women is explained by the smoking habits of men and estrogen-progesterone hormonal influence in the female reproductive life [11-14].

Most urinary bladder cancers consist of TCC, which can be classified into different categories with unique clinical pattern [15]. Low-grade, papillary lesions usually do not involve the muscle but often recur locally, demanding long-term surveillance. In contrast, high grade, non-papillary lesions are more prone for deeper invasion into the muscle layer and to metastasize, resulting in significant mortality. Contemporary studies have projected that papillary and non-papillary lesions may use various diabolical biological pathways, which may lead to their distinct biological manifestations [16]. Past analysis of patients with TCC bladder has used different denotation of young age, ranging from 20 years to 40 years. This diversion has led to inconsistent outcomes regarding the clinic-pathologic features of this dreaded disease in young individuals. Additionally, because TCC bladder is rare in young patients, most studies in these patients have been small series with the number of reported cases ranging from 12 to 50 [17]. To better characterize the clinic-pathologic features of TCC urinary bladder in young patients, we retrospectively evaluated a series of 71 cases in which clinical behavior, pathological outcomes, and disease recurrence and survival characteristics in patients with bladder TCC that were younger than 40 years of age. We compared our data with a matched cohort of young (Group A:  $\leq 30$  years Vs, Group B: 31- 40 years) patients with bladder TCC and intended to discover the difference in behavior of the disease between the two cohorts. The authors got on board to navigate the unexplored domain of TCC bladder with an aim to ascertain causality & risk factors predisposing to an early event, evaluate factors affecting disease recurrence and progression, estimation of survival characteristics and exact follow- up and radiological imaging schedule.

## II. METHODS

After obtaining institutional ethics committee clearance, a retrospective review of our records between Jan 2006 and Dec 2012 identified 71 patients (43 males and 28 females) with transitional cell carcinoma of the bladder who were less than 40 years old. Clinical and pathological parameters of patients who were  $\leq 30$  years of age were compared with those of patients between 31- 40 years of age during the same period. Epidemiological and demographic data, including patient's age at presentation, gender, time of starting

and total duration of smoking, presenting clinical symptoms, initial HPE report, tumor size and locations, stages and grades at initial TURBT, recurrence events and disease progression to different grades or stages, and metastatic status, were collected. The 2004 WHO International Society of Urologic Pathology and 2002 tumor stage classification were used to evaluate the stages and grades of TCC bladder. Patients with nontransitional cell variety and upper tract TCC were excluded from the analysis. Disease recurrence was defined as the return of the disease at any site within bladder and progression was defined as upstage in tumor stage/grade. Moreover, recurrence or progression-free periods were defined as the dates of initial diagnosis of bladder cancer and those of disease recurrence or progression. Patients less than 40 years old were divided into two subgroups according to the age of presentation: younger than 30 years old and between 31 and 40 years old. Data among the groups were analyzed using the Chi-square test and Pearson's R test. Recurrence-free survival (RFS) & progression-free survival (PFS) analyses were performed using the Kaplan Meier method and log-rank test. Multivariate cox proportional hazards analysis, was outlined to identify independent predictors of the recurrence of TCC of the bladder in patients less than 40 years old. All statistical analyses were performed using SPSS version 21. A p value of  $<0.05$  was considered statistically significant.

## III. RESULTS

We analyzed all relevant data between Jan' 2006 and Dec' 2012 and 71 patients (43 men and 28 women) with TCC of the bladder who were  $\leq 40$  years old were included in the study with subgroup analysis of  $\leq 30$  years ( $n=30$ ) and 31-40 years ( $n=41$ ). For the two retrospective cohorts, the mean age at diagnosis was 24.21 years (range, 20.25- 28.57 years) and 37.66 years (range, 34.50-39.67) with an overall male to female ratio of 1.54:1. The mean  $\pm$  SD (overall) follow up time was 47.41 months (range, 12-65 months) (Table 2). Male and female distribution in the 2 groups is shown in Figure 1.

The mean ( $\pm$  SD) pack year for tobacco smoking in the age group  $\leq 30$  yrs was  $30.22 \pm 4.36$  ( $p=.418$ ) while that for age group  $\leq 30$  yrs was  $10.25 \pm 2.14$  years. Similarly, mean  $\pm$  SD pack year for tobacco smoking in the age group 31-40 yrs was  $44.63 \pm 6.18$  while mean  $\pm$  SD smoking duration for age group  $\leq 30$  yrs was  $18.75 \pm 5.14$  yrs. The total number of active smokers in the group 1 was 53.3% while in the group 2 was 75.6% (Chi-square coefficient = 3.84,  $p= .048$ ) (Table 1). Smoking was defined in the current study as  $> 100$  cigarettes consumption overall as per the NIHS definition and was found to be significantly associated and correlated with TCC urinary bladder in the study (Pearson's  $R = .233$ ,  $p = .047$ ). Presence of risk factors was also ascertained and among all the risk factors

mentioned above, the presence of any one risk factor was considered positive, though not found to be significantly associated or correlated. There were 13.3% patients in the Group A (smoking + RF group), and 36.6% patients in the group B and both the groups were significantly associated and correlated with the same.

Macroscopic hematuria was the presenting symptom in 43.3% in the group A and in 58.5 % in the group B. Similarly, microscopic hematuria was the presenting symptom in 33.3% in the group A and 22 % in the group B. UTI / irritative voiding was the presenting symptom in 23.3% in the group A and 19.5 % in the group B (Figure 2). The mean time from the onset of symptoms to diagnosis was 38 days (range 14 – 67). Family history of TCC UB was present in 13.33 % (n=4) cases in group A and 10% cases (n=3) in the group B. History of neurogenic LUTD was present in 10 % (n=3) cases in group A and in 12.19% cases (n=5) in the group B. Mean tumor volume (USG) was  $2.45 \pm .45 \text{ cm}^2$  (range: 2.20 – 3.2) for the entire study population. Majority of the patients (46.48%) had a tumor at the trigone (n= 33). Initial TURBT was done in all 71 cases. Re TURBT was done in 1 case (26.67%) in group A and in 5 cases (17.07%) in group B. TURBT + BCG was initiated in 8 cases (3.33%) in group A and in 7 cases (12.20%) in group B. Radical cystoprostatectomy (males) and anterior pelvic exenteration (female) with diversion followed by adjuvant chemotherapy was done in 8 case (19.51%) in group B. Radical TURBT + adjuvant chemo-radiotherapy in the form tri-modality therapy was initiated in 6.67% (n= 2) cases in group A and in 14.63 % (n= 6) cases in group B.

The clinical scenario of study population is presented in (Table 3). The most common T stage in the group A was Ta (70%) followed by T1 (23.3%) while in the group B, the incidence of both the groups was similar (23.3%). The distribution of the T stage in both the groups was not significantly associated or correlated (Table 2). Tumor grading (2004, ISUP) was distributed as low grade in 56.7% followed by high in 26.7% in the group A. In the group B however, the maximum number of cases were PUNLMP (43.9%) followed by a low grade as a distant second (31.7%). All these grade distributions were found to be significantly associated and correlated in the two groups (Table 4)]. Incidence of the high grade was almost similar in both the groups at 26.7% and 24.4% respectively, but it was found that the younger cohort had more high -grade and low-grade TCC's combined (Table 2) as compared to 31-40 years age group. Aforementioned result comes as a stark contrast to the belief that early age group behaves less aggressively then there aged counterparts as described in literature. Multifocal tumors were found to be present in 78% of the group B vis a vis 36.7% in the group A (significantly associated & correlated) (Table 4). Tumor size  $\geq 2.5 \text{ cm}$  was seen in 20% cases in the group A and 14.6% cases in the group B. Tumor size

was not found to be significantly associated or correlated within the two respective groups (Table 4).

Tumor recurrence was seen in 16.7% cases in the group A and 43.9% in the group B and was significantly associated (Chi square coefficient =4.42,  $p=.045$ ) and correlated (Pearson's R = .250,  $p=.036$ ) (Table 5). One out of the total five recurrences (Ta, HG) in group A occurred within 3 months while the other 4 recurrence (Ta + T1, HG) occurred at 12 months. Nine out of the 18 recurrence in the group B (Ta + T1, HG) occurred within 3 months while 6/18 recurrence (Ta + T1, HG) occurred at 6 months. Three cases recurred between 18-24 months (Group B).

Tumor progression was seen in 6.7% cases in the group A and 36.6% in the group B and was significantly associated (Chi-square coefficient =7.12,  $p=.011$ ) and correlated (Pearson's R =.346,  $p=.003$ ). Among grade progression in the group A, one stage migration was observed from Ta to T1, and 1 from T1 to T2 and both occurred at 12 months of follow up. In the group B, 7 progressions from low grade to high grade TCC occurred at three months of follow up and five progressions from PUNLMP to Low grade at six months. Three cases progressed from low grade to high grade in between 18-24 months.

Multivariate logistic regression analysis projected tumor recurrence in study population with high-grade tumors [odds ratio (OR), 1.895; 95% confidence interval (CI),-.901-2.125;  $p = 0.036$ ] and multifocality (OR, 2.310; 95% CI, .941-3.341;  $p < 0.005$ ) (Table 6 ).The Kaplan Meier method was used to estimate the (RFS) recurrence free survival and (PFS) progression free survival. The 5-year RFS was 83% for group A and 56.1% for group B and the difference was found to be significant ( $p= .018$ ) between the 2 groups. The 5-year PFS was 93.2 % for group A and 63.4 % for group B and the difference was found to be significant ( $p= .005$ ) between the 2 groups.

#### IV. DISCUSSION

TCC urinary bladder in younger population ( $\leq 40$  years) is a rare entity, with an incidence rate of only 0.8% [18]. There is a paucity of evidence regarding validated literature when comparing clinical pattern and outcomes of bladder TCC in younger patients especially  $\leq 30$  years and 31-40 years. To our knowledge there are hardly any studies except one or two regarding the subgroup analysis in population concerning TCC urinary bladder. As per the available studies the low- Ta tumor recurs at a rate of 50% to 70% and progress in 5% of cases while the high-grade T1 tumor recur in more than 80% of cases and progress in 50% of patients within 3 years. Our analysis in part confirm the reverberation of previous reports and projects that patients  $\leq 30$  years of age had less recurrence (20% as compared 44%,  $p < .05$ ) and progression (6.7% as compared to 36.6%,

$p < .05$ ) than their counterparts in group B. This finding is supported by previous study results [19]. Notwithstanding the aforementioned fact, Group A did have high number of high grade TCC as compared to the group B. In our analysis, younger patients had more high-grade cancers than their aged counterparts (26.7% vs. 24.4%,  $p < .05$ ) and more tumors  $>2.5$  cm in size (20% vs. 14.6%), which was similar to the findings of previous retrospective studies [20]. Nonetheless, in the Surveillance, Epidemiology and End Results (SEER) database (1973 to 2003), of 140 bladder tumors affecting patients younger than 18 years old, 50.7% were diagnosed as PUNLMP. Thus, PUNLMP is regarded as the most common grade within this age group [21]. According to a recent analysis, although there is a preponderance of low-grade TCC in the first three decades of life, the grade distribution of TCC urinary bladder in older patients is not exactly comparable to those in the fourth decade of life which is also validated from our study results [22]. In our study, a male dominance was observed (male: female ratio 1.54:1) but which was below to those reported in previous analysis [23-25]. In both the groups under evaluation, the major presenting symptom was macroscopic hematuria with no significant difference between the younger and older patients. In a recent review of children with gross hematuria, causes of which consisted of infection, stones and malignancy, only three cases were diagnosed to have TCC bladder [26]. We have displayed in our analysis that stage distribution of patients aged 31-40 years with bladder TCC was not significantly different from their older counterparts, which is in concordance with some past published studies. In contrast, younger patients had slightly higher invasive disease which some studies indicated were due to CK20 along with mismatch repair proteins (MRPs) hMSH2, hMLH1, and hMSH6 along with FGFR3 [27]. We have analyzed our present data with the past studies and have found a comparable result thus validating our results (Table 7).

The Mantle Cox Log Rank was applied to estimate the five year RFS and five year PFS. The 5 yr RFS for the Group A was 83%, (Figure 3) while it was only 56.1 % for the Group B (Chi square 5.608,  $p = .018$ ). The mean recurrence free survival was an estimated 55.84 months (95% C.I. – 49.32-62.36) for the group A while it was 43.40 months (95% C.I.: 35.91-50.89). The 5 yr PFS for the Group A was 93.2 %, (Figure 4) while it was 63.4 % grade.

For the Group B (Chi square 7.93,  $p = .005$ ). The mean progression free survival was an estimated 61.84 months (95% C.I.: 57.90 - 66.02) for the group A while it was 48.74 months (95% C.I.: 42.18 - 55.30). To our misfortune, we could not do an extensive analysis because of the small number of cases, lack of sound

and apt information, and short follow-up period. Our study was limited by the fact that it was a retrospective study with inherent disadvantages, lack of CIS information in biopsy, lack of urine cytology information, correct age at start of smoking and exact duration of smoking before first symptom appearance and patient belonging to multiethnic groups.

## V. CONCLUSION

TCC urinary bladder is a heterogeneous disease with high prevalence and recurrence rates. The present analysis provides useful reckoning of survival outcome, with aggressive treatments reserved for patients with higher stage disease. The analysis projected similar low grade TCC in both the groups but slightly higher high grade lesions in the younger Group A, though the exact reason is still under consideration. Multifocality and tumor grade were the predominant factors associated with early recurrence and progression. We found out that smoking alone and along with other risk factors (as confounding factor) contribute significantly to the recurrence and progression risk profile. We also concluded that a strict follow up at 3 month and till 12 months for low grade + PUNLMP is a bare minimum while it's strictly every 3 month for first 2 yrs for high grade lesion. Although this ontological event is less frequent in young adults, its effects remain substantial because these cases have a large chunk of their life still undiscovered and many responsibilities to fulfill. Since young age carcinoma exhibit a combination of features seen in younger and older patients, treatment protocol needs to evolve in such a way so as to provide prompt diagnosis and most suitable treatment scheme. Future endeavors focus on advancement of risk stratification and treatment protocols through clinical trials in young cases and implementation of effective prevention and early detection at middle ages.

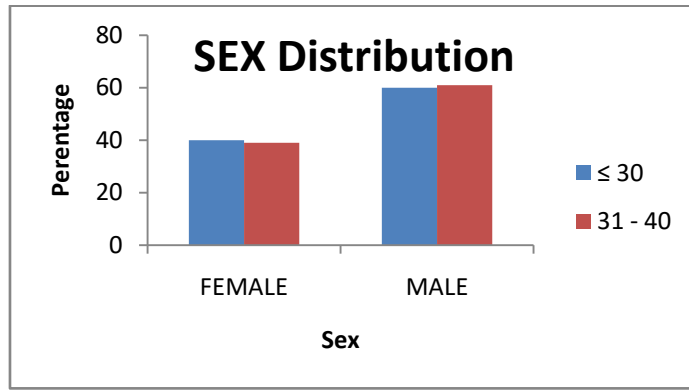


Figure 1: Showing gender distribution in the 2 subgroups

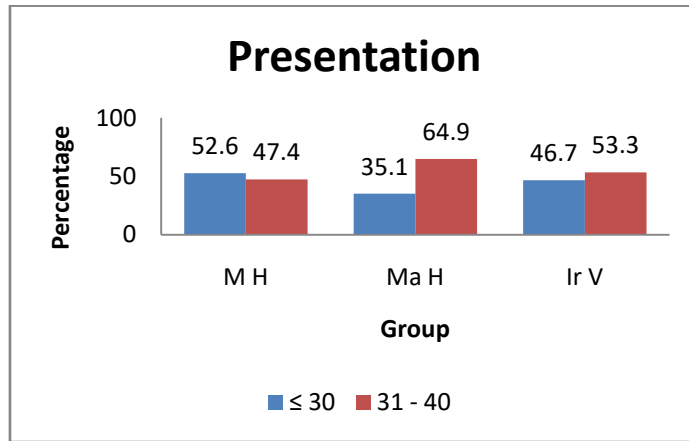


Figure 2 : Showing the clinical presentation in the 2 sub groups

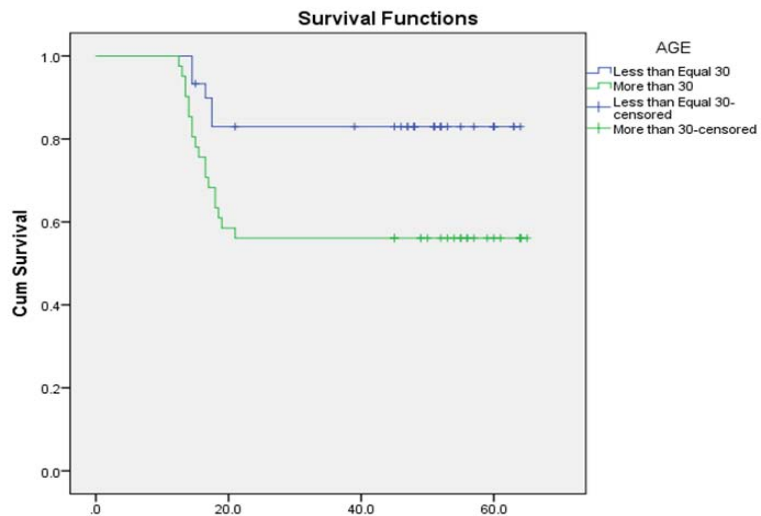


Figure 3: Showing the 5 Year RFS within Group A & B

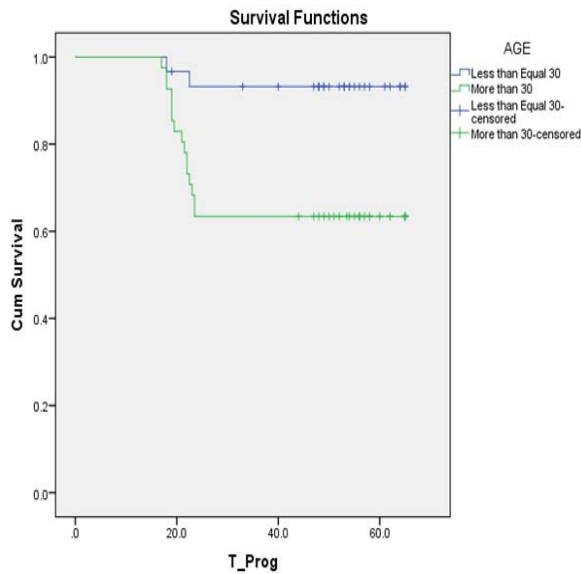


Figure 4: Showing the 5 Year PFS within Group A & B

Table 1: Showing the epidemiological and environmental pattern in both the subgroups

Variable	≤ 30 yrs n, (%)	31 – 40 yrs n, (%)	Total	Chi Square Coefficient	p Value
Patients	30 (42.3)	41 (57.7)	71		
Mean Age (range)			33.45(22 – 40)		
Sex (M/F)	18/12	25/16	43/28	.007	.934
Mean Follow Up (SD)	45.67± 11.40	49.15± 12.13	47.41 ± 12.74	.114	.430
Smoking (NHIS , > 100 cigarettes)	16 (53.3)	31 (75.6)	47 (66.2)	3.84	.048
Risk Factor*	10 (33.31)	19(46.3)	29(40.8)	1.213	.271
Smoking + Risk Factor	4 (13.3%)	15(36.6)	19(26.8)	4.77	.029

Table 2: Showing correlation of epidemiological data in the 2 groups.

Variable	Pearson R correlation Coefficient	p Value
Sex (M/F)	.010	.935
Mean Follow Up (SD)	.005	.847
Smoking (NHIS , > 100 cigarettes)	.233	.047
Risk Factor*	.131	.371
Smoking + Risk Factor	.259	.029

**Table 3:** Showing clinical parameters and distribution of T stage and grade in both the groups.

Variable	≤ 30 yrs n =30(42.3%)	31 – 40 yrs n =41(57.7%)	Total	Chi Square Coefficient	p Value
<b>Clinical Presentation</b>				1.72	.422
Microscopic Hematuria	10(33.3)	9(22)	19(26.8)		
Macroscopic Hematuria	13(43.3)	24(58.5)	37(52.1)		
Irritative voiding / UTI	7(23.3)	8(19.5)	15(21.1)		
<b>T Stage</b>				14.75	.060
Ta	21(70)	12(29.3)	33(46.5)		
T1	7(23.3)	12(29.3)	19(26.8)		
T2	2(6.7)	10(24.4)	12(16.9)		
T3	0	4 (9.8)	4 (5.6)		
<b>Grade</b>				16.56	.039
PUNLMP	5(16.7)	18(43.9)	23(32.4)		
Low Grade	17(56.7)	13 (31.7)	30 (42.3)		
High Grade	8(26.7)	10(24.4)	18(25.4)		
<b>Multifocal</b>				12.42	.001
>1 lesion	11(36.7)	32(78)	43(60.6)		
<b>Tumor Size</b> (≥ 2.5 cm )	6(20)	6(14.6)	12(16.9)	.355	.550

**Table 4:** Showing clinical parameters and correlation in both the groups.

Variable	Pearson R correlation Coefficient	p Value
<b>Clinical Presentation</b>		
Microscopic Hematuria	.054	.654
Macroscopic Hematuria		
Irritative voiding / UTI		
<b>T Stage</b>	.873	.114
<b>Grade</b>	4.52	.001
<b>Multifocal</b> >1 lesion	.488	.001
<b>Tumor Size</b> (≥ 2.5 cm )	.071	.350

**Table 5:** Showing tumor recurrence and progression in both the subgroups

Variable	≤ 30 yrs n =30(42.3%)	31 – 40 yrs n =41(57.7%)	Total	Chi Square Coefficient	p Value
Tumor recurrence	5(16.7)	18 (43.9)	24 (33.8)	4.42	.045
Tumor Progression	2(6.7)	15 (36.6)	17(23.94)	7.12	.011

**Table 6:** Multivariate cox regression analysis depicting significant variable predicting recurrence in young population

Variable	Odds ratio	95% C.I.	p Value
<b>Sex</b> (Male) (Female)	.984 1.025	.672 – 1.441 .573 – 1.815	.071
<b>Grade</b> PUNLMP Low Grade High Grade	1.000 1.013 1.895	.901 – 2.125	.036
<b>T Stage</b> Ta/T1 T2/T3	1.011 1.781	.810 – 1.954	.065
<b>Multifocality</b> ≤ 1 lesion >1 lesion	1.000 2.310	.941-3.341	.005
<b>Tumor Size</b> ≤2.5 cm >2.5 cm	.918 1.101	.814- 1.245	.544

**Table 7:** Comparison of vital statistics of the present study with past retrospective analysis

Author	Number of cases	Mean follow up (months)	Superficial Bladder Cancer (%)	Invasive Bladder Cancer (%)	Recurrence (%)	Progression (%)
Wen et al. <sup>12</sup>	30	72.8	76	23.4	50	8.3
Yossepowitch et al. <sup>14</sup>	74	28.1	83	16.6	38.7	16
Erozenci et al. <sup>28</sup>	156	87	89.1	10.9	48.7	22.8
Perez et al. <sup>29</sup>	30	66	67.6	23.3	32	0.1
<b>Present Study</b>	<b>71</b>	<b>45</b>	<b>73.2</b>	<b>33.8</b>	<b>33.8</b>	<b>23.94</b>

Grants: None

Acknowledgement: None

Conflict of interest: None

**REFERENCES RÉFÉRENCES REFERENCIAS**

- Johnson DE, Hillis S. Carcinoma of the bladder in patients less than 40 years old. J Urol 1978; 120: 172 e3.
- Wan J, Grossman HB. Bladder carcinoma in patients aged 40 years or younger. Cancer 1989; 64:178e81.
- Keetch DW, Manley CB, Catalona WJ. Transitional cell carcinoma of the bladder in children and adolescents. Urology; 1993; 42: 447 e9.
- S. Neogi, P.L. Kariholu, G. Dhakre, V. Gupta, N. Agarwal, P. Bhadani, Malignant urothelial carcinoma of urinary bladder in a young child: a rare case report, Urology 81 (2013) 888–890.
- Nomikos M, Pappas A, Kopaka ME, Tzoulakis S, Volonakis I, Stavrakakis G, et al. Urothelial carcinoma of the urinary bladder in young adults: presentation, clinical behavior and outcome. Adv Urol 2011; 2011:480738.
- Compe´rat E, Camparo P, Larre´ S, Roupret M, Neuzillet Y, Pignot G, et al. Urothelial carcinoma in patients under 40 years. Review of the cancer committee of the French Association of Urology Prog Urol 2013; 23:171e5.
- G.P. Paner, P. Zehnder, A.M. Amin, et al., Urothelial neoplasms of the urinary bladder occurring in young adult and pediatric patients: a comprehensive review of literature with implications for patient management, Adv. Anat. Pathol. 18 (2011) 79–89.
- A. Bujons, J. Caffaratti, J.M. Garat, H. Villavicencio, Long-term follow-up of transitional cell carcinoma of the bladder in childhood, J. Pediatr. Urol. 10 (2014) 167–170.
- Biswas RR, Mangal S, Guha D, Basu K, Karmakar D. An Epidemio logical Study of Cases of Urothelial Carcinoma of Urinary Bladder in a Tertiary Care Centre. JKIMSU. 2013:.
- Yeole BB, Jussawalla DJ. Descriptive epidemio logical assessment of urinary bladder and kidney cancers in Greater Bombay. Indian J Med Res. 1997; 106: 517–23.



11. Witjes JA, Debruyne FM. Bladder carcinoma in patients less than 40 years of age. *Urol Int* 1989; 44:81e3
12. Wen YC, Kuo JY, Chen KK, Lin AT, Chang YH, Hsu YS, et al. Urothelial carcinoma of the urinary bladder in young adults: clinical experience at Taipei Veterans General Hospital. *J Chin Med Assoc* 2005; 68:272e5
13. Kutarski PW, Padwell A. Transitional cell carcinoma of the bladder in young adults. *Br J Urol* 1993; 72:749e55
14. Yossepowitch O, Dalbagni G. Transitional cell carcinoma of the bladder in young adults: presentation, natural history and outcome. *J Urol* 2002; 168:61e6
15. Wild P.J., Giedl J., Stoehr R., Junker K., Boehm S., van Oers J.M., Zwarthoff E.C., Blaszyk H., Fine S.W., Humphrey P.A., Dehner L.P., Amin M.B., Epstein J.I., Hartmann A. Genomic aberrations are rare in urothelial neoplasms of patients 19 years or younger. *J. Pathol.* 2007; 211(1):18–25. doi: 10.1002/path.207
16. Sobin H, Gospodariwicz M, Wittekind C, editors. TNM classification of malignant tumors. 7th ed. UICC International Union against Cancer, Wiley-Blackwell; 2009
17. Epstein JI, Amin MB, Reuter VR, Mostofi FK. The World Health Organization/International Society of Urological Pathology consensus classification of urothelial (transitional cell) neoplasms of the urinary bladder: Bladder Consensus Conference Committee. *Am J Surg Pathol* 1998; 22:1435e48
18. Eble JN, Sauter G, Epstein JI, editors. World Health Organization classification of tumours. Pathology and genetics. Tumours of the urinary system and male genital organs. Albany, NY: WHO Publication Center; 2004. pp. 90e157
19. Paner GP, Zehnder P, Amin AM, Husain AN, Desai MM. Urothelial neoplasms of the urinary bladder occurring in young adult and pediatric patients: a comprehensive review of literature with implications for patient management. *Adv Anat Pathol* 2011; 18:79e89
20. Murta-Nascimento C, Schmitz-Draeger BJ, Zeegers MP, Steineck G, Kogevinas M, Real FX, et al. Epidemiology of urinary bladder cancer: from tumor development to patient's death. *World J Urol* 2007; 25:285e95
21. Fedewa SA, Soliman AS, Ismail K, Hablas A, Seifeldin IA, Ramadan M, et al. Incidence analyses of bladder cancer in the Nile delta region of Egypt. *Cancer Epidemiol* 2009; 33:176 e81
22. Kurz KR, Pitts WR, Vaughan Jr ED. The natural history of patient less than 40 years old with bladder tumors. *J Urol* 1987; 137:395e7
23. Ozbey I, Aksoy Y, Bicgi O, Polat O, Okyar G. Transitional cell carcinoma of the bladder in patients under 40 years of age. *Int Urol Nephrol* 1999; 31:655e9
24. Greenfield SP, Williot P, Kaplan D. Gross hematuria in children: a ten-year review. *Urology* 2007; 69:166e9
25. Habuchi T, Takahashi T, Kakinuma H, Wang L, Tsuchiya N, Satoh S, et al. Hypermethylation at 9q32e33 tumour suppressor region is age-related in normal urothelium and an early and frequent alteration in bladder cancer. *Oncogene* 2001; 20:531e7
26. Linn JF, Sesterhenn I, Mostofi FK, Schoenberg M. The molecular characteristics of bladder cancer in young patients. *J Urol* 1998; 159: 1493e6
27. M.L. Stanton, L. Xiao, B.A. Czerniak, C.C. Guo, Urothelial tumors of the urinary bladder in young patients: a clinicopathologic study of 59 cases, *Arch. Pathol. Lab. Med.* 137 (2013) 1337–1341
28. A. Erozcenci, S. Ataus, A. Pekyalcin, A. Kural, Z. Talat, and V. " Solok, "Transitional cell carcinoma of the bladder in patients under 40 years of age," *International Urology and Nephrology*, vol. 26, no. 2, pp. 179–182, 1994
29. J. Perez, C. Smet, and R. Pareja, "Transitional cell carcinoma of the bladder: behavior in young adults," *Archivos Espanoles de Urologia*, vol. 49, no. 6, pp. 607–612, 1996.



This page is intentionally left blank



GLOBAL JOURNAL OF MEDICAL RESEARCH: K  
INTERDISCIPLINARY

Volume 18 Issue 4 Version 1.0 Year 2018

Type: Double Blind Peer Reviewed International Research Journal

Publisher: Global Journals

Online ISSN: 2249-4618 & Print ISSN: 0975-5888

## Factors Determining Knowledge of HIV/AIDS among Bangladeshi Women

By Md. Jahirul Islam, Md. Murad Hossain, Sabrina Rahaman & Md. Zahid Hasan

*Bangabandhu Sheikh Mujibur Rahman Science and Technology University*

**Abstract-** South-Asian countries are considered to be a potential breeding ground for HIV epidemic. Although the prevalence of this incurable disease is low in Bangladesh, women still have been identified as more vulnerable group. The aim of this study is to assess the knowledge about HIV/AIDS and associated factors among the women in Bangladesh. The data used in this paper has been taken from Bangladesh Demographic Health Survey 2011. In this paper the sample of entire ever-married women aged between 15-49 years is approximately 991. For this paper the dependent variable is the "Knowledge of AIDS". The independent variables used in this study may be classified as demographic (age of the woman), socio-economic (woman's education, wealth index); location variables (urban /rural residence) and migration (number of months away from home); Family Planning (Exposure to Family Planning via Mass Media) and religion. All the potential confounders of knowledge of HIV/AIDS were being tested by chi square and then fit the binary logistic regression model to this data with the effects of the allied explanatory variables.

**Keywords:** HIV knowledge, logistic regression, bangladesh.

**GJMR-K Classification:** NLMC Code: WC 140



*Strictly as per the compliance and regulations of:*



© 2018. Md. Jahirul Islam, Md. Murad Hossain, Sabrina Rahaman & Md. Zahid Hasan. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License (<http://creativecommons.org/licenses/by-nc/3.0/>), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

# Factors Determining Knowledge of HIV/AIDS among Bangladeshi Women

Md. Jahirul Islam<sup>α</sup>, Md. Murad Hossain<sup>σ</sup>, Sabrina Rahaman<sup>ρ</sup> & Md. Zahid Hasan<sup>ω</sup>

**Abstract-** South-Asian countries are considered to be a potential breeding ground for HIV epidemic. Although the prevalence of this incurable disease is low in Bangladesh, women still have been identified as more vulnerable group. The aim of this study is to assess the knowledge about HIV/AIDS and associated factors among the women in Bangladesh. The data used in this paper has been taken from Bangladesh Demographic Health Survey 2011. In this paper the sample of entire ever-married women aged between 15-49 years is approximately 991. For this paper the dependent variable is the "Knowledge of AIDS". The independent variables used in this study may be classified as demographic (age of the woman), socio-economic (woman's education, wealth index); location variables (urban /rural residence) and migration (number of months away from home); Family Planning (Exposure to Family Planning via Mass Media) and religion. All the potential confounders of knowledge of HIV/AIDS were being tested by chi square and then fit the binary logistic regression model to this cram with the effects of the allied explanatory variables.

**Keywords:** HIV knowledge, logistic regression, bangladesh.

## I. INTRODUCTION

Among the incurable infectious diseases, acquired immune deficiency syndrome (AIDS) caused by the infection of human immune deficiency virus (HIV) has become a major global health problem in recent years. According to the UNAIDS [1], there were 36.7 million people living with HIV in 2015, which is 3.4 million higher than those of in 2010. In Asia and Pacific region, there were 5.1 million people living with HIV in 2015 [2], of which the South-Asian (SA) countries: China, India, and Indonesia account for about 75% of the total number of people living with HIV in this region [3]. In Bangladesh-a SA country, the prevalence of HIV is low (less than 0.1%) [4], which steadily increased since 1989 [5]. The reported number of people with HIV in Bangladesh increased by more than 300% (from 1207 in 2007 to 3674 in 2014) in seven years [6]. The recent estimates of the number of people living with HIV in Bangladesh in 2015 is about 9600, of which about 3200

are women aged 15 years and above [7]. Thus, Bangladesh with her low prevalence of HIV/AIDS, possesses a high risk of rapid spread of HIV/AIDS [5, 8-10].

There are many potential factors that are attributable to this increased risk of HIV infection and/or transmission: geographical and cultural proximity to India and Myanmar-two severely affected countries [8, 11], poverty, gender inequity, high levels of transitional sex [12], mobility of boatmen across the border area [13], and especially, the low-level knowledge about HIV/AIDS. With the vision of reducing the risk of HIV infection and transmission, we should concentrate on these potential factors, however, many of these factors are often linked with the country's health, demography, economy, politics, etc., which are not malleable enough to change or improvement. Instead, major concentration could be given on increasing the level of knowledge about HIV/AIDS, since the causes of HIV infection are known and can be escaped by being knowledgeable about HIV/AIDS. In the context of Bangladesh, the percentage of married women and married men with knowledge about HIV/AIDS were 67% and 87%, respectively, in 2007 [14]. This percentage increased only by 2% for married women and 1% for married men, respectively over the years 2007-2011 [15]. In 2014, Bangladesh Demographic and Health Survey (BDHS) identified female population as more vulnerable group than male population and observed that about 70% of the married women are knowledgeable about HIV/AIDS, which is very similar to that of documented in 2011 [6]. Accordingly, many studies [16, 17] reported that the level of knowledge among the men is higher compared to the women in Bangladesh. Moreover, the women bear the heavier onus of the consequences of the disease due to their standing in a less advantaged socio-economic position, limited access to sexually, and reproductive health care [18], and subsequently, women are considered to be more vulnerable to HIV infection and transmission [10]. In addition, the perception among the women in Bangladesh about HIV/AIDS is often contaminated with myths, facts, and rumors [19], which further contribute to HIV infection and/or transmission.

In this critical condition, to control HIV infection and/or transmission, preventive measures (e.g. increasing the level of knowledge) for women could be effective, which has been recommended in earlier

**Author α:** M.S student, Dept. of Statistics, Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj-8100, Bangladesh. e-mail: sadid.shimul@gmail.com

**Author σ:** Assistant professor, Dept. of Statistics, Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj-8100, Bangladesh.

**Author ρ ω:** Lecturer, Dept. of Statistics, Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj-8100, Bangladesh.

studies [16, 20, 21]. Since any effective vaccine to completely cure from HIV/AIDS is not available yet [22], spreading correct knowledge about HIV/AIDS should be the very first step to raise awareness about HIV/AIDS. Lack of knowledge about HIV/AIDS is usually positively associated with misconception, confusion, social stigma, poor sex behavior [23], which contribute to the increase in HIV infection and transmission. Increasing women's knowledge about HIV/AIDS will facilitate long-term controlling of HIV/AIDS epidemic [17] and will still be effective even when there is limited/poor healthcare facilities. Assessing the current scenario of women's knowledge status in Bangladesh and identifying the associated factors will be helpful for government and non-government organizations to develop more structured and specific target program regarding HIV/AIDS prevention.

In this regard, Khan [21] investigated the adolescents married women (10–19 years) in Bangladesh and reported female education, media use, and condom use as potential predictors of women's knowledge about HIV/AIDS. Rahman, M.S. and Rahman, M.L. [16] studied married women of wider age group (15–49 years) and identified the use of media as a strong tool to spread HIV knowledge and, also reported socio-economic status as an important factor. Likewise, Yaya et al. [17] studied a sample of ever married women in Bangladesh and demonstrated a positive association between the women's knowledge and their respective husbands' increasing level of education. Although there have been notable research works conducted earlier to assess the knowledge status of married women in Bangladesh, most studies focused on a particular study period. There are only few studies [24] that examined the trends and determinants of knowledge about HIV/AIDS among the married women in Kenya over the years 1993–2009.

Studying the trends and determinants of women's knowledge will disclose more windows about the changing behavior of the associated factors and their varying effects over time. To best of our knowledge, no earlier studies in Bangladesh examined the trends and determinants associated with the knowledge about HIV/AIDS among the married women in Bangladesh. The main goal of the study is to analyze the data of BDHSs 2011, and investigate the factors associated with the ever-married women's knowledge about HIV/AIDS in Bangladesh. This study will help the government and policy makers to evaluate the present scenario of knowledge about HIV/AIDS among the women in Bangladesh. We expect this study will help in constructing necessary programs that might contribute to control HIV infection or AIDS disease in Bangladesh.

## II. DATA METHODS AND MATERIALS

### a) *Data Source*

The data used in this paper has been taken from Bangladesh Demographic Health Survey 2011. The sample in this survey is a stratified, nationally representative sample of households.

### b) *Sample design*

The sample is based on two-stages, the first stage of sampling consists of 260 PSUs (82 in urban areas and 178 in rural areas) which was selected using systematic sampling with probability proportional to size. During the second stage of sampling selection, for all regions systematic sampling was performed on about 30 households per PSU on average in urban areas and about 36 households per PSU on average in rural areas, to obtain statistically reliable key demographic and health variables, giving a total sample size of 10,793 observations along with 4,743 variables. Further details are available in the Bangladesh Demographic and Health Survey 2011. In this paper the sample of entire ever-married women aged between 15–49 years is approximately 991. For this paper the dependent variable is the "Knowledge of AIDS" with category coded as 1 if yes and 0 if no. All the potential confounders of knowledge of AIDS were being tested in the binary logistic regression model. The mathematical analysis was performed using SPSS (version 16.0)

### c) *Data processing*

All questionnaires for the BDHS were periodically returned to Dhaka for data processing at Mitra and Associates. The dealing out of the data composed began curly after the fieldwork originated.

The processing operation consisted of work place editing, coding of open-ended questions, data ingress, and editing inconsistencies initiated by the computer programs.

### d) *Variables Used*

In the BDHS 2011 survey women were asked about many facets of lives that included household population and housing characteristics, fertility, family planning, proximate determinants of fertility, fertility preferences, infant and child mortality, adult and maternal mortality, HIV/AIDS related knowledge, attitudes and behavior, women empowerment and other related factors. Based on earlier studies on HIV/AIDS awareness, the variables were selected for this study and are discussed below. The variables used in this study may be classified as demographic (age of the woman), socio-economic (woman's education, wealth index); location variables (urban /rural residence) and migration (number of months away from home); Family Planning (Exposure to Family Planning via Mass Media) and religion.

e) *Statistical Technique*

i. *Chi-square statistic*

The chi square statistic is defined as

$$\chi^2 = \sum_i \frac{(O_i - E_i)^2}{E_i}$$

ii. *Odds and Odds Ratio*

Odds are the ratio of probability of an event will occur divided by the probability of it will not occur. Mathematically,

$$\text{Odds} = \frac{P(\text{Success})}{P(\text{Failure})} = \frac{P}{1-P} \quad \text{where } p \text{ is the probability of success}$$

Odds always have values greater than zero and if odds value is larger than one it means that success will occur more likely than failure. Odds ratio, as the name indicates, is the ratio of two Odds.

$$\text{Mathematically Odds ratio} = \frac{\frac{P_1}{1-P_1}}{\frac{P_2}{1-P_2}}$$

$$\ln \frac{P_i}{1-P_i} = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_k x_{ki} \dots \dots \dots (1)$$

Where  $p_i = P(Y_i = 1) = 1 - P(Y_i = 0)$ , ( $Y_i = 1$ ), ( $Y_i = 0$ ) is the probability of success and failure of an observation  $i$  respectively.  $\beta_0 = \log$ -odds when all  $x_{ji}$

Where  $O_i$  is the observed number of cases in category  $i$ , and  $E_i$  is the expected number of cases in category  $i$ .

Here,  $P_1$  and  $P_2$  refer to the probability of success in group 1 and group 2 respectively.

iii. *Logistic Regression Model*

Binary logistic regression is a type of regression analysis where the dependent variable is a dummy variable. The logistic regression model use logit transform and formula represented as

are 0,  $\beta_j =$  increase in log-odds when  $x_{ji}$  is increased by one unit,  $j=1, \dots, k$ ,  $e^{\beta_j} =$  increase in odds when  $x_{ji}$  is increased by one unit,  $j=1, \dots, k$

III. RESULTS AND DISCUSSION

Table 1: The distribution of women by the knowledge on HIV/AIDS

Variables and their categories	Knowledge on HIV/AIDS		Total (%)	Pearson $\chi^2$	P value
	Having Knowledge on HIV/AIDS (%)	Having no Knowledge on HIV/AIDS (%)			
<b>Age of Women</b>					
15-25	8.3	4.2	12.5	4.291	0.232
26-35	23.2	8.0	31.2		
36-45	28.3	12.9	41.2		
46-55	10.9	4.2	15.2		
<b>Wealth Index</b>					
Rich	17.2	7.0	24.1	.037	0.458
Poor	53.5	22.4	75.9		
<b>Religion</b>					
Muslim	69.4	2.9	72.8	8.194E2	0.000
Non-muslim	0.8	26.4	27.2		
<b>No. of Month away from Home</b>					
At home	28.1	10.8	39.9	0.821	0.202
Away from home	42.5	18.6	61.1		
<b>Place of Residence</b>					
Urban	45	3.2	48.2	2.288E2	0.000
Rural	25.6	26.1	51.8		
<b>Radio</b>					
Has Radio	58.1	16.3	74.5	76.588	0.000
Has no Radio	12.5	13.0	25.5		
<b>Television (TV)</b>					
Has TV	16.0	6.5	22.5	.061	0.437
Has no TV	54.6	22.9	77.5		
<b>Educational Attainment</b>					
Literate	59.6	4.1	63.8	4.402E2	0.000
Illiterate	11.0	25.2	36.2		

Basic information of the respondents' of Women by Knowledge on HIV/AIDS with some essential

variable is listed in table1. This investigation confirmed that women has knowledge on HIV/AIDS is highest

(28.3%) in the age interval of 36-45 and women has no knowledge on HIV/AIDS is the lowest (12.5%) in the age interval of 15-25. Being most of the people living in Bangladesh are poor. This investigation confirmed that women by knowledge on HIV/AIDS are highest (53.5%) in poor people and the lowest (7.0%) in the rich people. Being most of the people living in Bangladesh are Muslim, it was usual to have a larger portion from that religion group in the sample but the analysis presented the remarkable portion (69.4%) of having knowledge on HIV/AIDS in Muslim Women where as women has no knowledge on HIV/AIDS is lowest (26.4%) in non-Muslim women. Most the women in Bangladesh are stay at home. But the analysis show that the highest (42.5%) number women having knowledge on HIV/AIDS whom away from home where as the lowest (10.8%) number women having no knowledge on HIV/AIDS whom stay at home. The output of our study strongly supported the common phenomenon that the women living in urban area that the highest (45.0%) number women having knowledge on HIV/AIDS whereas the women living in rural area the lowest (25.6%) number women having knowledge on HIV/AIDS. In the perspective of Bangladesh most of the families are able to use radio. This paper show that the highest (58.1%) number of women having knowledge on HIV/AIDS who has radio but lowest (13%) number of women having no

knowledge on HIV/AIDS who has no radio. Most of the families are not able to use TV. This analysis gives that the highest (54.6%) number of women having knowledge on HIV/AIDS who has no TV but lowest (6.5%) number of women having no knowledge on HIV/AIDS who has TV. There was considerable differentiability in percentage of Women by Knowledge on HIV/AIDS in the context of respondents' education level. Women with literate the highest (59.6 %) percentage to have Knowledge on HIV/AIDS whereas that percentage (25.1%) for illiterate women has Knowledge on HIV/AIDS.

Bivariate analysis suggested that a considerable involvement ( $\chi^2=8.194E2$ ,  $df=1$ ,  $p<0.05$ ) between religion from where the sample was drawn and dichotomous variable of women by the knowledge on HIV/AIDS. Respondents' education level, a very important variable significantly impacted on this dichotomous variable ( $\chi^2=4.402E2$ ,  $df=1$ ,  $p<0.05$ ). In bivariate analysis, the other variables media (radio), place of the residence, appeared to be influential impact on HIV/AIDS because of having large chi-square standards and  $p<0.05$  for every cases. In identifying explanatory variables for insertion in the logistic regression, 4 variables were considered, namely religion, religion, place of residential, expose to media (radio) and educational attainment.

Table 2: Binary Logistic Regression model with select independent variables

Predictors	Coefficient B	P value	Odds ratio
Religion (Ref: Non Muslim) Muslim	-6.661	0.000	0.001
Place of Residence (Ref: Rural) Urban	-2.654	0.000	0.070
Radio (Ref: Has no Radio) Has radio	-1.308	0.000	0.270
Educational Attainment (Ref: Illiterate) Literate	-1.098	0.000	0.310

#### IV. CONCLUSIONS

The first major objective of the study is to investigate the impact of the determinants having knowledge on HIV/AIDS in Bangladeshi women. Among all independent characteristics education plays a fundamental role having knowledge on HIV/AIDS in Bangladeshi women. This study proved that literate women have more knowledge on HIV/AIDS than the illiterate women. Radio plays an important rule to acquire knowledge on HIV/AIDS. Different times radio broad-cast different drama about HIV/AIDS. Hearing the drama women are more serious about it. Religion has also positive effect having knowledge on HIV/AIDS. Among Muslim percentage of having knowledge on HIV/AIDS is highest and lowest among the non-Muslim women in Bangladesh. In the perspective of Bangladesh most of the families are able to use radio. This paper

show that the highest number of women having knowledge on HIV/AIDS who has There are two different place of residence where the people lived. The behavior manners and cultures are more or less dissimilar in urban and rural people and hence the knowledge on HIV/AIDS is unlike. From the analysis we see that the Table 2 reports B coefficients and odds ratios for the variables retained in the select model, with religion, place of residence, radio and educational attainment of the respondents proving to be particularly significant in predicting of women by the knowledge on HIV/AIDS. The odds of having knowledge on HIV/AIDS in Muslim women is 1% higher than the odds of having knowledge on HIV/AIDS in non-Muslim women. Women living in the urban area are 0.070 times more knowledge on HIV/AIDS than those women living in the rural area. Those women who have radio are 0.270 times more knowledge on HIV/AIDS than those who have no radio.

Respondents who attained education are found to knowledge on HIV/AIDS 0.310 times more liable than the women who are illiterate in educational attainment.

Women who live in urban area have more knowledge than those who live in rural area.

## REFERENCES RÉFÉRENCES REFERENCIAS

1. UNAIDS: Global aids update 2016. Technical report. 2016. <http://www.unaids.org/en/resources/documents/2016/Global-AIDS-update-2016>.
2. UNAIDS: The prevention gap report. Technical report. 2016. [http://www.unaids.org/sites/default/files/media\\_asset/2016-prevention-gap-report\\_en.Pdf](http://www.unaids.org/sites/default/files/media_asset/2016-prevention-gap-report_en.Pdf).
3. AVERT: Hiv and aids in asia& the pacific regional overview. Technical report. 2017. <https://www.avert.org/professionals/hiv-around-world/asia-pacific/overview>.
4. Nahar Q, Alam MS, Chowdhury EI, Azim T, Alam N, Saifi R, Khan SI, Oliveras E, Reza M. 20 years of hiv in bangladesh: experiences and way forward. Technical report. 2009. <http://citeweb.info/2009/05463>.
5. Islam MM, Conigrave KM. Hiv and sexual risk behaviors among recognized high-risk groups in Bangladesh: need for a comprehensive prevention program. *Int J Infect Dis.* 2008; 12(4):363–70. doi: 10.1016/j.ijid.2007.12.002. [Pub Med] [Cross Ref].
6. NIPOORT, Mitra and Associates, and ICF: Bangladesh demographic and health survey 2014. Technical report, National Institute of Population Research and Training (NIPOORT), Mitra and Associates, and ICF International, Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPOORT, Mitra and Associates, and ICF International. 2016. <http://microdata.worldbank.org/index.php/catalog/>
7. UNAIDS: HIV and AIDS Estimates. <http://www.unaids.org/en/regionscountries/countries/Bangladesh>.
8. Gibney L, Choudhury P, Khawaja Z, Sarker M, Islam N, Vermund S. Hiv/aids in bangladesh: an assessment of biomedical risk factors for transmission. *Int J STD & AIDS.* 1999; 10(5):338–46. doi: 10.1258/0956462991914087. [PubMed]
9. Gibney L, Choudhury P, Khawaja Z, Sarker M, Vermund S. Behavioural risk factors for hiv/aids in a low-hiv prevalence muslim nation: Bangladesh. *Int J STD & AIDS.* 1999; 10(3):186–94. doi: 10.1258/0956462991913862. [PMC free article] [PubMed]
10. ssain M, Mani KK, Sidik SM, Shahar HK, Islam R. Knowledge and awareness about stds among women in Bangladesh. *BMC Public Health.* 2014; 14(1):775. doi: 10.1186/1471-2458-14-775. [PMC free article] [PubMed].
11. Mondal NI, Takaku H, Ohkusa Y, Sugawara T, Okabe N, et al. Hiv /aids acquisition and transmission in Bangladesh: turning to the concentrated epidemic. *Jpn J Infect Dis.* 2009; 62(2):111–9. [PubMed].
12. UNICEF: Hiv and aids in bangladesh. Technical report. 2010. [https://www.unicef.org/bangladesh/HIV\\_AIDS\(1\).pd](https://www.unicef.org/bangladesh/HIV_AIDS(1).pd).
13. Gazi R, Mercer A, Wansom T, Kabir H, Saha NC, Azim T. An assessment of vulnerability to hiv infection of boatmen in tekna, bangladesh. *Confl Health.* 2008; 2(1):5. doi: 10.1186/1752-1505-2-5. [PMC free article] [PubMed] [Cross Ref].
14. NIPOORT, Mitra and Associates, and ICF: Bangladesh demographic and health survey 2007. Technical report, National Institute of Population Research and Training (NIPOORT), Mitra and Associates, and ICF International, Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPOORT, Mitra and Associates, and ICF International. 2009. <http://microdata.worldbank.org/index.php/catalog/2562>.
15. NIPOORT, Mitra and Associates, and ICF: Bangladesh demographic and health survey 2011. Technical report, National Institute of Population Research and Training (NIPOORT), Mitra and Associates, and ICF International, Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPOORT, Mitra and Associates, and ICF International. 2013. <http://microdata.worldbank.org/index.php/catalog/256>.
16. Rahman MS, Rahman ML. Media and education play a tremendous role in mounting aids awareness among married couples in bangladesh. *AIDS Res Therapy.* 2007; 4(1):10. doi: 10.1186/1742-6405-4-10. [PMC free article] [PubMed] [Cross Ref].
17. Yaya S, Bishwajit G, Danhouno G, Shah V, Ekholuenetale M. Trends and determinants of hiv/aids knowledge among women in bangladesh. *BMC Public Health.* 2016; 16(1):812. doi: 10.1186/s12889-016-3512-0. [PMC free article] [PubMed] [Cross Ref].
18. Garai J. Gender and hiv/aids in bangladesh: A review. *J Health Soc Sci.* 2016; 1(3):181–98.
19. Rahman MM, Kabir M, Shahidullah M. Adolescent knowledge and awareness about aids/hiv and factors affecting them in bangladesh. *J Ayub Med College Abbottabad.* 2009; 21(3):3–6. [PubMed].
20. Islam MT, Mostafa G, Bhuiya AU, Hawkes S, De Francisco A. Knowledge on, and attitude toward, hiv/aids among staff of an international organization in bangladesh. *J Health Popul Nutr.* 2002; 20(3): 271–8. [PubMed].
21. Khan MA. Knowledge on aids among female adolescents in bangladesh: evidence from the



- bangladesh demographic and health survey data. *J Health PopulNutr.*2002; 20(2):130–7. [PubMed].
22. Myhre L, June S, Flora A. Hiv/aids communication campaigns: progress and prospects. *J Health Commun.*2000; 5(sup1):29–45. doi: 10.1080/108107300126731. [PubMed] [Cross Ref].
  23. Varni SE, Miller CT, Solomon SE. Sexual behavior as a function of stigma and coping with stigma among people with hiv/aids in rural new england. *AIDS Behav.* 2012; 16(8):2330–9. doi: 10.1007/s10461-012-0239-5. [PMC free article] [PubMed] [Cross Ref].
  24. Ochako R, Ulwodi D, Njagi P, Kimetu S, Onyango A. Trends and determinants of comprehensive hiv and aids knowledge among urban young women in kenya. *AIDS Res Ther.* 2011; 8(1):11. doi: 10.1186/1742-6405-8-11. [PMC free article] [PubMed] [Cross Ref].





GLOBAL JOURNAL OF MEDICAL RESEARCH: K  
INTERDISCIPLINARY

Volume 18 Issue 4 Version 1.0 Year 2018

Type: Double Blind Peer Reviewed International Research Journal

Publisher: Global Journals

Online ISSN: 2249-4618 & Print ISSN: 0975-5888

# A New Anti-Aging Signaling Molecule with an Absorption Peak around 264 nm along with Resveratrol Extracted from Sprouted Black Gram, Green Gram, or Kidney Bean Seeds by Applying Pulsed Heating

By G. Soundra Pandian

*Madanapalle Institute of Technology and Science*

**Abstract-** For anti-aging, Resveratrol was viewed as the ultimate molecule earlier, and now the world is looking at NAD<sup>+</sup> (along with Resveratrol or its equivalent Pterostilbene). The author succeeded in extracting a good quality Resveratrol without unwanted proteins from sprouted Peanut kernels by applying pulsed heat and filed a patent. The author was then trying to produce trans-resveratrol from sprouted beans like black gram, green gram, kidney bean etc by using the same method of pulsed heating and was surprised to see that all these beans produced trans-resveratrol with an absorption peak in the range of 306 to 308 nm along with another strong peak around 264 nm. The 1cm long root of the sprout ejected the new molecule with abs peak at 264 nm along with Resveratrol under pulsed heat. (Bubbles were coming out of the root-hole of the bean-sprout when the heat pulse was turned off). The NAD<sup>+</sup> and NR compounds have an absorption peak at 260 nm same as that of melted/denatured DNA and other internals of a cell, but it appears that the live sprouted-seeds produced a new signaling molecule before death of the cells inside the seeds.

*GJMR-K Classification: NLMC Code: QV 738*



*Strictly as per the compliance and regulations of:*



© 2018. G. Soundra Pandian. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License <http://creativecommons.org/licenses/by-nc/3.0/>, permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

# A New Anti-Aging Signaling Molecule with an Absorption Peak around 264 nm along with Resveratrol Extracted from Sprouted Black Gram, Green Gram, or Kidney Bean Seeds by Applying Pulsed Heating

G. Soundra Pandian

**Abstract-** For anti-aging, Resveratrol was viewed as the ultimate molecule earlier, and now the world is looking at NAD<sup>+</sup> (along with Resveratrol or its equivalent Pterostilbene). The author succeeded in extracting a good quality Resveratrol without unwanted proteins from sprouted Peanut kernels by applying pulsed heat and filed a patent. The author was then trying to produce trans-resveratrol from sprouted beans like black gram, green gram, kidney bean etc by using the same method of pulsed heating and was surprised to see that all these beans produced trans-resveratrol with an absorption peak in the range of 306 to 308 nm along with another strong peak around 264 nm. The 1cm long root of the sprout ejected the new molecule with abs peak at 264 nm along with Resveratrol under pulsed heat. (Bubbles were coming out of the root-hole of the bean-sprout when the heat pulse was turned off). The NAD<sup>+</sup> and NR compounds have an absorption peak at 260 nm same as that of melted/denatured DNA and other internals of a cell, but it appears that the live sprouted-seeds produced a new signaling molecule before death of the cells inside the seeds. The author was thrilled to see that the same result was obtained for different pulse beans. It is not clear if this newly found unknown molecule will signal something like resveratrol (to alert the cell system about the stress) or like NAD<sup>+</sup> (that will signal to produce extra energy in the cell to enable survival under stress) or both.

## I. INTRODUCTION

Resveratrol is thought to rev up one of the sirtuins, SIRT1, which appears to help protect mice on high doses of resveratrol from the ill effects of high-fat diets.[1] Increased expression of the SIRT1 protein, when induced by a synthetic small molecule activator of SIRT1 (SRT2104), extended both the mean and maximal lifespan of mice [2]. For anti-aging Resveratrol was viewed as the ultimate product earlier, and now the world is looking at NAD<sup>+</sup> (along with Resveratrol or its equivalent Pterostilbene) [1]. Giving older mice a chemical called NAD for just one week made 2-year-old-mice tissue resemble that of 6-month-old mice (in human years, that would be akin to a

60-year-old's cells becoming more like those belonging to a 20-year-old). [3], [4]

The author was trying to extract pure resveratrol and his work resulted in filing up of a patent [5] where proteins-free Resveratrol was extracted from sprouted peanut kernels by applying pulsed heat. Later as a curiosity, the author tried that trick to extract Resveratrol from Black gram, Green gram, and kidney beans sprouts. Surprisingly this leads to a discovery that these budding plants excreted an un-known molecule with UV absorption peak of around 264 nm along with trans-Resveratrol.

## II. EXPERIMENT WITH BLACK GRAM

The black gram seeds were immersed in a right quantity of water for two days leading to sprouts. The outer skin cover of these sprouts was initially not removed; these sprouts were put in fresh water and a pulsed form of heat was applied. When the heat pulse was ON, the water just began to give boiling bubbles in the water, and when the heat pulse was OFF, the sprouted kernels reacted by ejecting something in the form of bubbles coming out of the roots for some time. The process of pulse heating was continued for about 30 minutes, and the water extract was tested in a UV spectrometer.

*Author: Senior Professor, Department of ECE, Madanapalle Institute of Technology and Science, Madanapalle, Chittoor District, Andrapradesh State, India. e-mail: drpandiangs@mits.ac.in*

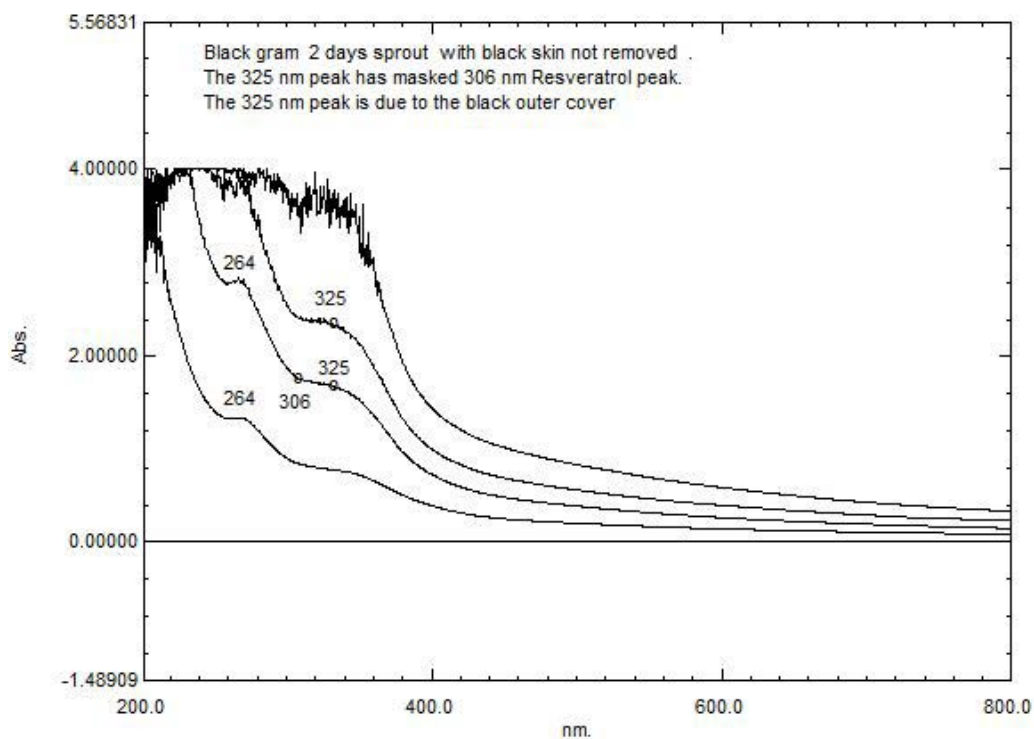


Fig. 1: UV absorption spectrum of water extract of Black gram sprouts with skin not removed

Figure 1 shows the UV spectrum obtained. It was disappointing at first to see that there was no peak at 306 nm corresponding to Resveratrol. Instead, there were two peaks, one around 325 nm and another at 264 nm. The black cover sticking to the baby sprouts of

black gram seeds was suspected to give some unwanted signals, and so the experiment was repeated by removing the black skin. Figure 2 shows the UV response obtained that showed the Resveratrol peak at 306 nm, but the peak at 264 nm did not go away.

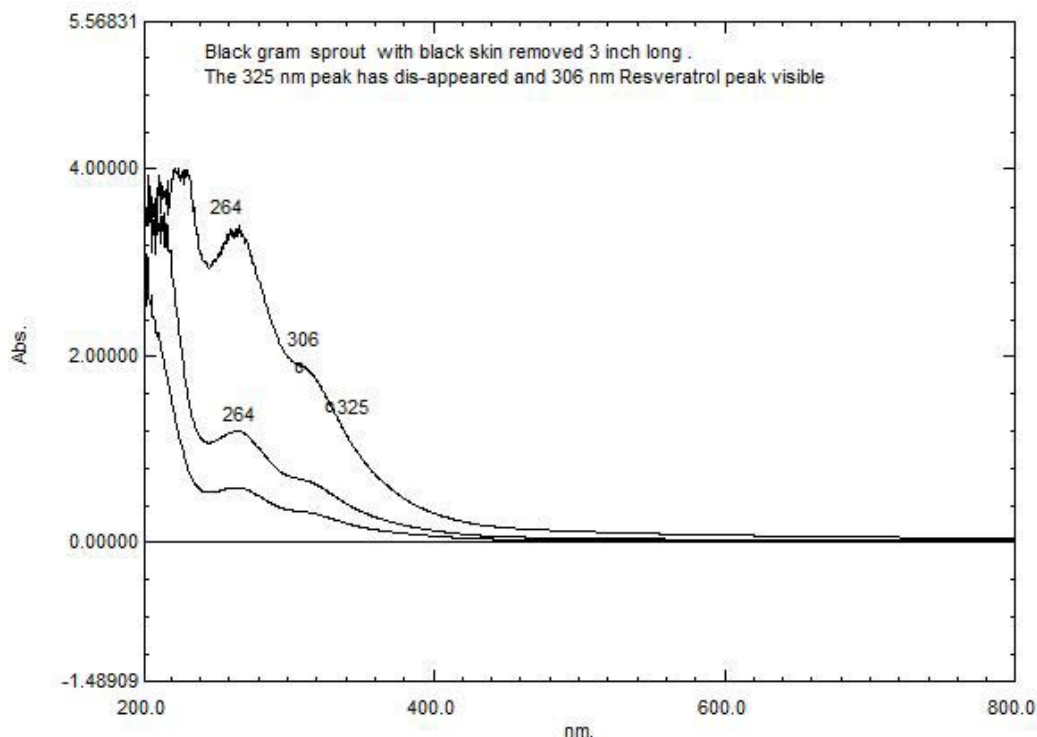


Fig. 2: UV absorption spectrum of water extract of Black gram sprouts without skin

### III. EXPERIMENT WITH GREEN GRAM

Green gram seeds were sprouted by soaking the seeds in water for about 36 hours. The green cover from each sprout was removed. The skin-less sprouts were put in fresh water, and a pulsed heating was applied for 30 minutes. The water extract after heating was tested in the UV spectrometer. Fig.3 shows the UV

spectrum obtained. There were the same clear two peaks similar to black gram one at 306 nm for Resveratrol and another at 264 nm. The curiosity regarding 264 nm peak increased. Since it was close to 260 nm, the author thought that the plant was giving an important nucleus related signaling in addition to Resveratrol.

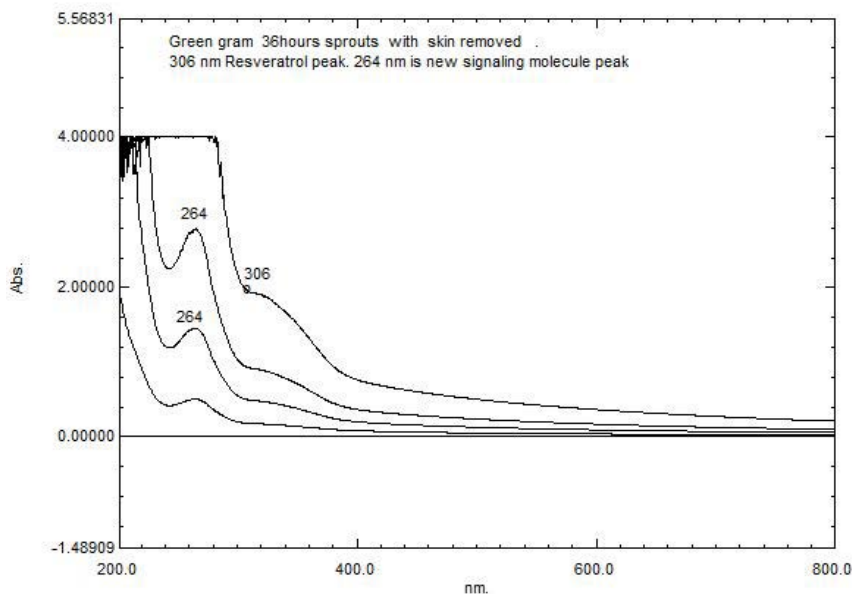


Fig. 3: UV absorption spectrum of water extract of Green gram sprouts without skin

### IV. EXPERIMENT WITH KIDNEY BEAN

Kidney Bean seeds were made to sprout with root emerging from the seed with a length of about two cm. The seed cover was removed, and pulsed heating was applied by keeping the sprouts in water. Fig.4 shows

the spectrum obtained. There were the same clear two peaks similar to black gram and green gram one at 306 nm for Resveratrol and another at 264 nm. In fact, the peak at 264 nm was much stronger than the Resveratrol peak at 306 nm.

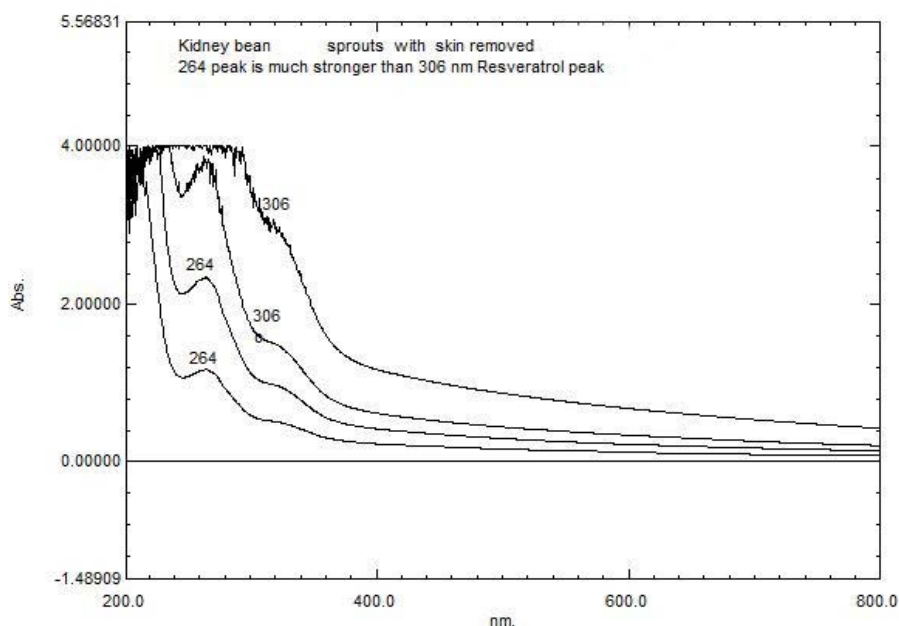


Fig. 4: UV absorption spectrum of water extract of Kidney bean sprouts with skin removed

## V. FURTHER EXPERIMENTS

When the sprouts grew with green leaves, the UV spectrum showed an increase in the Resveratrol peak and a decrease in the 264 nm peak. In fact, any green plant along with the roots emitted Resveratrol via the holes in the root ends. Even grass (Korai grass) with a black bulb at the bottom as well as 6-inch long sweet sorghum plants emitted Resveratrol but not the molecule corresponding to the 264 nm peak. That is, the 264 nm peak is coming only from the baby sprouts of the pulse seeds. When experimenting with the sprouts of Chick-pea, accidentally continuous over-heating got applied to the sprouts (without removing the skin of the seeds), and the UV spectrum showed a cis-Resveratrol and a peak at 260 nm (meaning that the cells were dead due to quick over-heating) instead of 264 nm. That means the molecule corresponding to the peak at 264 nm was a clear signaling molecule given out by the cells before death (something similar to Resveratrol that is given out by healthy plants under stress). The author drank the water extract of the new molecule (along with resveratrol built in) of black gram and green gram on different days and no side effects were noticed. No overflowing new energy was noticed after drinking the extract, but instead reduced energy or drive level was experienced for a one-shot trial.

## VI. USE OF THE NEW SIGNALING MOLECULE

The author believes that the signaling molecule with a peak at 264 nm will play a major role in the anti-aging supplements. In what way this molecule either alone or along with Resveratrol and NAD<sup>+</sup> will increase the life of mice (and humans) will have to be tested.

## VII. CONCLUSION

This article presented the discovery of a new molecule with an absorption peak at 264 nm from baby sprouts of black gram, green gram and Kidney beans. This molecule is believed to be a signaling molecule emitted by the heat-stressed baby sprouts that will play a role in anti-aging in the future.

## REFERENCES RÉFÉRENCES REFERENCIAS

1. David Stipp, "Beyond Resveratrol: The Anti-Aging NAD Fad", Scientific American, Guest Blog, March 11, 2015, <https://blogs.scientificamerican.com/guest-blog/beyond-resveratrol-the-anti-aging-nad-fad/>.
2. Mercken E. M., Mitchell S. J., Martin-Montalvo A., Minor R. K., Almeida M., Gomes A. P., Scheibye-Knudsen M., Palacios H. H., Licata J. J., Zhang Y., Becker K. G., Khraiweh H., González-Reyes J. A., Villalba J. M., Baur J. A., Elliott P., Westphal C., Vlasuk G. P., Ellis J. L., Sinclair D. A., Bernier M., de Cabo R. (2014). "SRT2104 extends survival

of male mice on a standard diet and preserves bone and muscle mass". *Aging Cell*. 13 (5): 787-96. doi:10.1111/ace.12220. PMC4172519. PMID24931715.

3. Alice Park, "Reversing Aging: Not as Crazy as You Think. Harvard researchers find a new compound that can make old cells young again", *TIMES*, Dec. 19, 2013.
4. Gomes AP1, Price NL2, Ling AJ2, Moslehi JJ3, Montgomery MK4, Rajman L2, White JP5, Teodoro JS6, Wrann CD5, Hubbard BP2, Mercken EM7, Palmeira CM6, de Cabo R7, Rolo AP8, Turner N4, Bell EL9, Sinclair DA10, "Declining NAD (+) induces a pseudohypoxic state disrupting nuclear-mitochondrial communication during aging.", *Cell*. 2013 Dec 19; 155(7): 1624-38. doi: 10.1016/j.cell.2013.11.037.
5. G. Soundra Pandian, "A simple green method of extracting good quality Trans-Resveratrol without unwanted Proteins from sprout Peanut Kernels by using a Pulsed Heater", Patent Filed on 27/04/2018, Application Number: 201841015907, The patent office Journal India No 18/2018 dated 24/05/2018.



GLOBAL JOURNAL OF MEDICAL RESEARCH: K  
INTERDISCIPLINARY

Volume 18 Issue 4 Version 1.0 Year 2018

Type: Double Blind Peer Reviewed International Research Journal

Publisher: Global Journals

Online ISSN: 2249-4618 & Print ISSN: 0975-5888

## Silent Lacunary Brain Infarctions Associated with Left Ventricular Noncompaction and Idiopathic Epilepsy: A Case Report

By Mihaela Lungu, Violeta Sapira, Doina Carina Voinescu & Manuela Arbune

*University of Galati*

**Abstract-** Left ventricular noncompaction is a rare cause of cardiomyopathy, sometimes with a family character that may complicate evolving with heart failure, heart rhythm disorders and systemic embolic events - including stroke. We report a case of a young patient in neurological dispensary for epilepsy where the neuroimaging evaluation of an acutely installed cephalalgia syndrome revealed multiple silent lacunar brain injuries. Paraclinical examinations of their etiology have led to the diagnosis of a left ventricular noncompaction, in this context the lacunar infarcts being considered as cerebral embolic events with a cardiac starting point.

**Keywords:** *left ventricular noncompaction, silent lacunar infarction.*

**GJMR-K Classification:** *NLMC Code: WL 301*



S I L E N T L A C U N A R Y B R A I N I N F A R C T I O N S A S S O C I A T E D W I T H L E F T V E N T R I C U L A R N O N C O M P A C T I O N A N D I D I O P A T H I C E P I L E P S Y A C A S E R E P O R T

*Strictly as per the compliance and regulations of:*



RESEARCH | DIVERSITY | ETHICS

© 2018. Mihaela Lungu, Violeta Sapira, Doina Carina Voinescu & Manuela Arbune. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License (<http://creativecommons.org/licenses/by-nc/3.0/>), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

# Silent Lacunary Brain Infarctions Associated with Left Ventricular Noncompaction and Idiopathic Epilepsy: A Case Report

Mihaela Lungu <sup>α</sup>, Violeta Sapira <sup>σ</sup>, Doina Carina Voinescu <sup>ρ</sup> & Manuela Arbune <sup>ω</sup>

**Abstract-** Left ventricular noncompaction is a rare cause of cardiomyopathy, sometimes with a family character that may complicate evolving with heart failure, heart rhythm disorders and systemic embolic events - including stroke. We report a case of a young patient in neurological dispensary for epilepsy where the neuroimaging evaluation of an acutely installed cephalalgia syndrome revealed multiple silent lacunar brain injuries. Paraclinical examinations of their etiology have led to the diagnosis of a left ventricular noncompaction, in this context the lacunar infarcts being considered as cerebral embolic events with a cardiac starting point.

**Keywords:** left ventricular noncompaction, silent lacunar infarction.

## I. INTRODUCTION

Left ventricular noncompaction (LVNC) is a rare cardiomyopathy, characterized by the presence of an excessive trabeculation of the myocardium, which mostly affects the left ventricle. There are numerous excessive trabeculations and intertrabecular recesses, which communicate with the left ventricular cavity.

Pathogenetically it is believed that the cardiomyocyte compaction process should stop during embryogenesis.

Clinical aspects are similar to other cardiomyopathies and include systolic and diastolic dysfunctions of the left ventricle, tachyarrhythmias and systemic embolism.

## II. CASE REPORT

A 35-year-old female patient that went through neurological dispensary for 10 years for idiopathic epilepsy with generalized tonic-clonic seizures controlled by anticonvulsant therapy with valproic acid and salts - 1000 mg/day was admitted into our neurological department due to an acute onset of a headache.

The family history of the patient included sudden deaths of several members: mother, uncle mother's brother and maternal grandmother.

Personal pathological antecedents included: idiopathic epilepsy with generalized therapeutically controlled crises, erosive gastritis with secondary mild iron anemia and irritable bowel.

The overall clinical examination of the organism and systems was within regular limits with normal blood pressure values, and the neurological exam did not reveal any neurological signs of the outbreak.

The neuro-imaging evaluation was a cerebral magnetic resonance angiography done with gadolinium which showed lacunary images in the temporal right lobe in the posterior hippocampus around the temporal ventricular horn as well as deep in the right insular area and also in the right brain peduncle, without any contrast intakes. The appearance of multiple silent lacunar infarctions imposed for further investigations to find out the etiology.

Blood tests have reported a mild iron deficiency anemia, with hemoglobin of 10.4 g/dl, mean corpuscular volume – 75 fL, iron deficiency – 29 µg/dl and ferritin 5.9 ng/ml. Tumor markers for the digestive tract were within ordinary limits. We performed an upper digestive endoscopy with an antral mucosa biopsy, which showed us the appearance of erosive gastritis.

The lipogram had normal values. We performed several tests to check for thrombophilia, for antiphospholipid antibody syndrome, for vasculitis and for thyroid disorders, which also proved negative, excluding these etiologies. The borreliosis, HIV and syphilis tests were also negative.

The extra cranial Doppler exam did not detect any carotid, vertebral or subclavian lesions.

The 24-hour Holter-electrocardiogram for rhythm didn't detect any paroxysmal rhythm disorders.

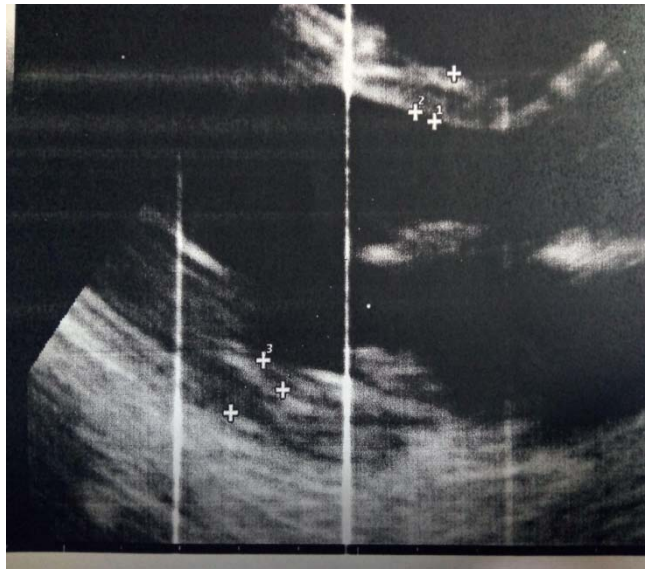
Cardiac echography revealed a mitral regurgitation- grade II, with eccentric jet towards the posterior left atrial wall, the lateral wall, the apex and the lower wall of the left ventricle with a trabecular structure: LV = 51/34; LA=31; RV=21; RA=27; IVS=8; AO desc=15; EF=55%. Conclusion: noncompaction cardiomyopathy. Mild mitral regurgitation – fig.1:

**Author α:** Neurological Department, Emergency Clinical Hospital of Galați, Faculty of Medicine and Pharmacy, "Dunărea de Jos" University of Galați, Romania. e-mails: mihaelalungu17@yahoo.com, violetasapira@yahoo.com

**Author ρ:** Head of Medical Department, Faculty of Medicine and Pharmacy, Galați, Romania. e-mail: carinavoinescu@gmail.com

**Author ω:** Faculty of Medicine and Pharmacy, "Dunărea de Jos" University of Galați, Romania. e-mail: arbunemanuela@yahoo.com





*Fig. 1:* The Echocardiographic aspect of left ventricular noncompaction

Regarding the complex investigations mentioned above, which allowed the exclusions of other causes for lacunar infarctions, taking into account the cardiac echocardiographic aspect, the cerebral lesions were possibly indicative of embolic mechanism, starting from the ventricular noncompaction area.

Also, considering the hereditary history of the patient which includes three cases of sudden deaths in first and second degree relatives, one can assume a family component of these type of cardiomyopathy.

The patient is in the neurological dispensary, receives antiepileptic drugs: 1000 mg of Depakine Chrono/day – with therapeutic control of the seizures and anticoagulant treatment with gastric protection. Iron deficiency anemia was solved using specific treatment. The risk of the anticoagulant remedy in a patient with epileptic seizures remains in question.

### III. DISCUSSIONS

Left ventricular noncompaction (LVNC) is a rare cardiomyopathy with an incidence of 0,05-1,3/100.000 births<sup>[1]</sup>.

LVNC includes the persistence of the fetal spongiform structure with an excessive trabeculation of the myocardium, which mostly affects the left ventricle<sup>[2,3]</sup>, but possibly also the right ventricle<sup>[3]</sup>.

There are numerous excessive trabeculations and intertrabecular recesses, which communicate with the left ventricular cavity<sup>[2]</sup>, but it does not connect with the coronary circulation. It occurs in adults as well as in children.

In human hearts, the left ventricle has up to 3 prominent trabeculations, and it has fewer trabeculations than the right ventricle<sup>[4]</sup>.

The condition can appear in two forms: an isolated and a non-isolated one, associated with other congenital diseases: ventricular septal defects, atrial

septal defects, pulmonic stenosis, hypoplastic left ventricle, facial dysmorphism<sup>[5]</sup>.

The American Heart Association has classified LVNC as primary genetic cardiomyopathy<sup>[6]</sup>, while The European Society of Cardiology considers it as unclassified cardiomyopathy, based on the fact that LVNC may be a morphological manifestation of other severe distinct cardiomyopathies.

LVNC is not considered distinct cardiomyopathy, being included by some authors as a congenital or acquired morphological characteristic of other declarative cardiomyopathies.

Pathogenetically it was suggested that the most important fact might be an arrest of myocardial fibers in the intrauterine development, resulting in two different myocardial layers: one compacted and one non-compacted, trabeculated<sup>[3]</sup>.

It can be either secondary to congenital ventricular outflow tract obstructions or familial (Barth's syndrome)<sup>[7]</sup>.

Studies of the genetics of the LVNC have strongly suggested that the disease has an inheritance pattern (18% to 50% of cases are familial)<sup>[6]</sup>.

Several studies suggest that LVNC is a genetical and heterogeneous disease with a sporadic and also a familial form, with pathogenic mutations in the genes encoding proteins such as cytoskeletal, mitochondrial, sarcomeric and Z-line proteins. Various autosomal dominant, recessive, X-linked or mitochondrial transmissions were described<sup>[8]</sup>.

In sporadic cases which are common, there were detected new mutations<sup>[8]</sup>.

There is the absence of a specific genotype-phenotype association in LVNC, the mutation of the same gene can determine LVNC as well as declarative or hypertrophic cardiomyopathies, which make the genetic testing have a restrained utility.

There were three genes identified as correlating with NCV: dystrobrevin-alpha (DTNA), cipher/ZASP (Z-line component which is both found in the skeletal muscle as well as in the cardiac muscle), TAZ (a gene with unknown dysfunction which is involved in the X-linked declarative cardiomyopathy) [8].

Clinical aspects are similar to other cardiomyopathies and include systolic and diastolic dysfunctions of the left ventricle, tachyarrhythmias and systemic embolism [9].

The asymptomatic period varies significantly, but average duration from the onset of the symptoms to the diagnosis is, on average, of three years [10].

The triad formed by the symptoms of heart failure arrhythmia and cardio embolic events is the clinical manifestation in patients with diastolic dysfunction of the left ventricle [11]. Different types of arrhythmias can occur, from atrial fibrillation – 7 – 26% to sustained ventricular tachycardia [1].

The most important symptom is dyspnea, due to low cardiac output. Tachyarrhythmias in Wolf-Parkinson-White syndrome, ventricular tachycardia's, atrioventricular blocks, bundle branch blocks and even sudden death have been reported [5].

Over a mean follow-up of four years, the 36-year-old patient had cardiac events. There were five cardiac deaths, 16 heart failure hospitalizations, ten ventricular arrhythmias and five thromboembolic events [12].

Another study made by Chin et al. on 8 patients with LVNC state, revealed a cardio embolic event of a stroke type in a 2,3-year-old child, that led to his death [2].

Two series reported transitory ischemic attacks or stroke in 25% of all patients with LVNC. [1, 2]. Because the incidence of atrial fibrillation in these patients in 29% of the cases, systemic anticoagulation is recommended. The patients with LVNC have a different prognosis. Some studies associate the disease with high mortality due to heart failure and sudden cardiac death [5]. Others patients have a better prognosis [8]. The prognosis depends on the stage of the disease at the moment of the diagnosis, by the severity of the heart failure and of the improvements due to treatment.

The most significant preclinical diagnosis is the echocardiogram-transthoracic echocardiogram TTE (two-dimensional TTE and three-dimensional TTE), but also heart computed tomography and magnetic resonance detect left ventricular trabeculations and recesses, which serve as a nidus for mural thrombus [6, 13].

For the positive diagnosis, the ratio between non-compacted and compacted myocardium must be above 2 (Jenny Criteria) [3].

There was a high rate in the prevalence of LVNC in the last years, due to a better diagnosis with more perform ant echocardiography [13].

There is no specific therapy for LVNC. The treatment addresses the three types of clinical manifestations: heart failure – beta-blockers, angiotensin converting enzyme inhibitors, diuretics, arrhythmias- ant arrhythmic drugs and systemic embolic events- anticoagulation [9].

#### IV. CONCLUSIONS

1. Multiple silent lacunar infarctions in a young epileptic patient, without any vascular risk factors and with a family history of sudden death is a challenge, and it requires extensive paraclinical investigations, both for finding out the etiology as well as for the differential diagnosis.
2. In the clinical case of the patient we presented, the essential examination was cardiac echography, this being the one that detected the LVNC, which can explain through embolic mechanism the occurrence of silent cerebral lacunar infarctions.
3. The case is clinically significant because the incidence of LVNC cases is very low and out of these cases only 25% are quoted as having during their evolution a stroke episode which occurred through the embolic mechanism.
4. The familial history is suggestive for a potential familial cardiomyopathy.
5. Preventing systemic embolic recurrence involves, even the absence of associated atrial fibrillation the administration of anticoagulant medication.
6. The anticoagulant medication in a patient which also takes epileptic treatment may be risky, but the therapeutic control of the seizures has allowed the choice of this therapeutic option.
7. It is necessary to follow up the patient to apply a requisite treatment promptly in the case of a possible complication (heart failure, atrial fibrillation, neurological complications- ex.: head trauma).

This article does not contain any studies with human participants, performed by any of the authors.

Informed consent: the informed consent of the patient was obtained and written in the observation sheet.

*Financial disclosure:* None.

#### *Abbreviations*

LVNC- left ventricular noncom action  
 MRI – magnetic resonance imaging  
 HIV- human immunodeficiency syndrome  
 TTE-transthoracic echocardiogram  
 LV- left ventricle  
 RV- right ventricle  
 LA- left atrium  
 RA- right atrium  
 IVS – interventricular septum  
 EF – ejection fraction  
 Ao- aortic artery

## REFERENCES RÉFÉRENCES REFERENCIAS

1. Ritter, M., Oechslin, E., Suetsch, G. et al. Isolated noncompaction of the myocardium in adults. *Mayo Clin. Proc.*, 1997; 72: 26-31.
2. Chin T.K., Perl off, J.K., Williams, R.G. et al. Isolated noncompaction of myocardium. A study of eight cases. *Circulation*, 1990; 82: 507-13.
3. Jenni, R., Oechslin, E. Non-compaction of the left ventricular myocardium from clinical observation to the discovery of a new disease. *European Cardiology*, 2005, 1: 1-4.
4. Song, Z.Z. Echocardiography in the diagnosis of left ventricular non-compaction. *Cardiovascular Ultrasound*, 2008; 6:64.
5. Oechslin, E.N., Attenhofer, J.C.H., Rojas, R.R. et al. Long-term follow-up of 34 adults with isolated left ventricular non-compaction: a distinct cardiomyopathy with poor prognosis. *J. Am. Coll. Cardiol.*, 2000; 36: 493-500.
6. Popescu, I., Ionescu, G., Mornos, C., Gavrilescu, D., Cozma, D., Gonta, F. Left ventricular non-compaction-case report. *TMJ*, 2011, vol. 61, no.3-4, 247-248.
7. Camm, A.J, Luscher, T.F., Seruys, P.W. The ESC Textbook of Cardiovascular Medicine, second edition. Oxford University Press, 2009, pg.290.
8. Murphy, R.T., Tharman, R., Blanes, J.G. et al. Natural history and familial characteristic of isolated left ventricular non-compaction. *Eur. Heart J.* 2005; 26:187-92.
9. Apetrei E. clinical cardiology Buchares, Ed. Med. Callisto, 2015, pg. 830-838.
10. Stanciulescu, P.F., Stanciulescu, L.F., Stanciulescu, A. Familial declarative cardiomyopathy. *Medical Journal of Bucovina*, vol.III, nr.1, 2017, 1-9.
11. Botto, L.D. Left ventricular non-compaction. *OrphanetEnciclopedia*, 2004, [http:// www. orphanet/ data/patho/GB/uk-LVNC.pdf](http://www.orphanet/data/patho/GB/uk-LVNC.pdf).
12. Andreini, D, Pontone, G., Bogoert, J., Roghi, A., Barison, A. ET. Al. Long-term prognostic value of cardiac magnetic resonance in left ventricle non-compaction. *Journal of the American College of Cardiology*, vol.68, nr.20, 2016, 2166-2181.
13. Baker, G.H., Pereira, N.L., Hlavacek, A.M. et al. Tran thoracic real-time three-dimensional echocardiography in the diagnosis and description of non-compaction of ventricular myocardium. *Echocardiography*, 2006; 23:490-494.



GLOBAL JOURNAL OF MEDICAL RESEARCH: K  
INTERDISCIPLINARY  
Volume 18 Issue 4 Version 1.0 Year 2018  
Type: Double Blind Peer Reviewed International Research Journal  
Publisher: Global Journals  
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

## Drug Prescribing and Dispensing Practice in Public Hospitals in Tigray Regional State, Ethiopia

By Tesfay Teklemariam  
*Tigray Health Research Institute*

**Abstract- Background:** Rational use of drugs requires that patients receive medicines appropriate to their clinical needs, in doses that meet their individual requirements, for an adequate period of time, and at the lowest cost to them and the community. Irrational prescription of drugs is a common occurrence in clinical practice. The cost of such irrational drug use is enormous in terms of both wastage of scarce resources and the adverse clinical consequences of therapies that may have real risks but no objective benefits. Therefore, the aim of this study is to assess the drug prescription and dispensing practice of public hospitals in Tigray Region.

**Methods:** A total of 768 prescriptions were reviewed retrospectively from outpatient departments of public hospitals from August 04 -21 2011. The selected hospitals include, one Referral, two zonal and two district hospitals and 384 patients/care takers were interviewed after they collect their drugs.

**Keywords:** *rational drug use, prescribing, dispensing, ethiopia.*

**GJMR-K Classification:** *NLMC Code: WB 300*



*Strictly as per the compliance and regulations of:*



# Drug Prescribing and Dispensing Practice in Public Hospitals in Tigray Regional State, Ethiopia

Tesfay Teklemariam

**Abstract- Background:** Rational use of drugs requires that patients receive medicines appropriate to their clinical needs, in doses that meet their individual requirements, for an adequate period of time, and at the lowest cost to them and the community. Irrational prescription of drugs is a common occurrence in clinical practice. The cost of such irrational drug use is enormous in terms of both wastage of scarce resources and the adverse clinical consequences of therapies that may have real risks but no objective benefits. Therefore, the aim of this study is to assess the drug prescription and dispensing practice of public hospitals in Tigray Region.

**Methods:** A total of 768 prescriptions were reviewed retrospectively from outpatient departments of public hospitals from August 04 -21 2011. The selected hospitals include, one Referral, two zonal and two district hospitals and 384 patients/care takers were interviewed after they collect their drugs.

**Results:** A total of 768 prescriptions were analyzed, average number of drugs per encounter were 1.77 which is in line with World health Organizations recommendation. Three hundred forty eight 45.3% prescriptions had antibiotics. Majority 72.4%, of the drugs were prescribed by generic name and 16% prescriptions had injections per encounter. Most of the drugs were prescribed from essential drug list 98.0%. However, only 11.7 were adequately labeled. Similarly, patient interview revealed that, only 36.0% of patients has adequate knowledge regarding the prescribed drugs. More than half 56.9 % of patients don't know for what disease the drug is prescribed. Most 83.9% of patients know how frequent they should take the drug but only 46.2% of the patients know the dose of the drug they supposed to take.

**Conclusion:** The prescription pattern in terms of the number of drugs prescribed per prescription is good. Prescribing drugs by generic name, antibiotic and injection prescriptions, filling of prescriptions with the necessary information, and drug leveling were not in compliance with WHO recommendation. Prescribers and dispensers should follow the WHO guidelines.

**Keywords:** rational drug use, prescribing, dispensing, ethiopia.

## I. BACKGROUND

Drugs have become one of the most essential components of the health Care systems worldwide, drugs saves lives. This indisputate fact makes rational selection, procurement, distribution

and rational uses of drugs of paramount importance in health care. (1)

Drugs are an essential component of health care delivery. When used rationally, they produce the desired effect of improving patient's illness. Their irrational use on the other hand leads to prolongation of the illness, development of adverse effects, and unnecessary expense. Irrational drug use pertains to the use of drugs when they are not needed. It also means prescribing drugs without adequate study regarding their efficacy, safety, affordability, and suitability to the patient. Many countries are doing their best to limit the problem of irrational drug use by developing national programs that promote appropriate prescribing behavior. (2)

The concept of rational drug use during the past few years has been the Theme of various national and international gatherings; in simple words rational drug use means prescribing the right drugs in adequate dose for the sufficient duration and appropriate to the clinical needs of the patient at the lowest cost. The definition implies that rational use of drugs, especially rational prescribing should meet certain criteria as follows: Appropriate indication. The decision to prescribe drug(s) is entirely based on medical rationale and that drug therapy is an effective and safe treatment. Appropriate drug: The selection of drugs is based on efficacy, safety, suitability and cost considerations. Appropriate patient: No contra-indications exist and the likelihood of adverse reactions is minimal, and the drug is acceptable to the patient. Appropriate information. Patients should be provided with relevant, accurate, important and clear information regarding his or her condition and the medication(s) that are prescribed. (3)

The world health organization /International Network for Rational Use of Drugs (WHO/INRUD) has set standards that should apply to prescribing, under-prescribing can result in sub therapeutic effects. Secondary infections, a false sense of wellness and delayed treatment. Over-prescribing on the other hand, can lead to unwanted drug interactions, adverse effects and ultimately patient noncompliance. As a result, treatment failure usually leads to the prescribing of newer treatment regimens that are usually more costly and less tolerable, thus reducing the chances of treatment success. (5)

*Author:* Tigray public health research institute, PO. Box 7, Tigray region, North Ethiopia. e-mail: tesfa7@gmail.com

Rational use of drugs took the stage after whose 1985 Nairobi conference experts used its central theme. The conference emphasized the need for the public understand and use of drugs better, particularly in view of all that was known about non adherence to treatment. In many cases, neither the prescriber nor the patient was to blame for irrational use, it is often resulted from lack of proper information and training, compounded in some cases by fear, carelessness, or miss leading persuasion from the seller or others.(6)

## II. STATEMENT OF THE PROBLEM

Irrational drug use has been occurred for as long as drugs have been available. In treating patients with modern medicine there exist several choices of therapy rather than just one that all providers must follow. This increase the irrational drug treatment encounters and, ultimately, poor patient outcomes. (3) In effective and irrational use of drugs is a wide spread problem at all levels of health care. Per capital wastage from inefficiencies and irrational use tends to be greatest in hospitals. Despite this, medicines are often managed and used inefficiently and irrationally. (7)

The overall use of drugs at hospital in many countries at least from the point of view of consumption is relatively small compared to the national drug budgets. But this is not the case in Ethiopia were hospitals consume about 50% of the total drugs budgets. The spectrum of the therapeutic classes of drugs employed in hospitals is also wider than in other types of health facilities. More over physicians may also have an influence on drug prescription. (8)

The actual use of drugs is influenced by a wide range of factors, including drug availability, providers experience, economic influences, cultural factors, community belief systems and the complex interactions among these factors. Drug use pattern reflect human behavior and must be viewed from a social science perspective rather than a biomedical perspectives. (9)

The rational use of drugs demands prescription of appropriate drugs; availability of drugs at the right time, at a price people can afford, that it be dispensed correctly and that it be taken in the right dose at the right intervals and for the right length of time. Irrational drug use is a common practice in developing countries. In India, a baseline hospital survey showed that poly-pharmacy was common, in both inpatient and outpatient departments. The use of antibiotics and injections was higher in inpatients compared to outpatients (11).

In countries like Uganda, the Sudan and Zimbabwe such national programs were shown to positively influence the drug use pattern. In Ethiopia, several efforts have been made to promote the rational use of drugs. Among these, the publication of Essential and National Drug List for Ethiopia, and the recent introduction of the Standard Treatment Guidelines (STG) are the most notable. (12)

In the above cited studies in addition to this encouraging trend of generic prescribing, low averages number of drugs and low cost per prescription were among the positive trends noted. Although the commendable efforts of the Drug Administration and Control Authority and relevant professional schools and associations have produced some good results, there are indications that the rational use of drugs in Ethiopia is far from satisfactory. Results from the following studies illustrate some of the common problems of irrational drug use in Ethiopia. A baseline survey conducted in 8 hospitals in southern Ethiopia looked in to the prescription pattern and factors that influence prescribing behavior. This study indicated that the practice of poly-pharmacy, overuse of antibiotics and injections were widespread. The survey revealed that acquired habits, patient's demand, lack of drug information, and peer norms were the major underlying factors for irrational prescribing. The study clearly demonstrated the patterns of drug utilization in rural hospitals. However, the picture could be different in referral and teaching hospital, because the composition and qualification of technical staff and the financial capacity are not comparable. (12) The aim of this study will be to investigate rational prescribing and dispensing indicators in public hospitals in Tigray Regional state, Ethiopia. (12)

Irrational Drug Use can destroy all the benefits of careful, cost effective selection, procurement and distribution of drugs. Resources spent on procurement are lost if the correct drugs are not prescribed and dispensed to the correct patient. (14)

Some of the most common irrational drug use in Ethiopia's health institutions includes, prescribing drugs when the health problem is self-limiting and the patient would get better without taking any drugs, prescribing several drugs or poly pharmacy would provide the same effects. Providers may use three, four and five and sometimes more drugs to treat the most trial conditions for the sake of satisfying patients need to receive drugs, medical practitioners and other health professionals giving less time to patients and not explaining some basic information about use of drugs, (15)

In some studies conducted in North West Ethiopia, the overuse of antibiotics and injections in primary health care facilities, misuse of antibiotics in inpatients, low adherence of prescribers to the basic principles of prescription writing and over consumption of anti-infective, have been reported. But, less is known regarding the overall rational drug use in Ethiopian hospitals, particularly at outpatient health care levels. Some studies have attempted to evaluated the general drug prescribing profiles among out patients, in dispensaries, for specific classes of drugs, and in pediatric in patients. Most of these studies are neither patients nor diagnosis linked. Drug prescribing for

outpatients is done by various types of health professionals, and outpatient clinics deliver therapeutic service to a large segment of the patients. It follows that assessment of prescribing pattern in these important medical care facilities is of obvious relevance to identify problems regarding rational use and to propose interventions. Adherence of patients to a treatment program is necessary for the success of the program. Non-adherence or noncompliance results from factors related to the drug, the patient, the prescriber and the environment. One important prescriber factor leading to non-compliance is not giving the patient adequate information regarding his illness or the importance, effect, and adverse effects of the treatment. Result of a study illustrated that great majority of our patients are not given such essential information. In this study, out of 200 patients from four hospitals in Addis Ababa, asked whether they were given information about their medications, only 5.5% were informed about drug-drug interaction, 7% About adverse effect of the drug, and only 9.5% were given information about contraindication of the drug they were given. (12)

The above cited examples probably show only the tip of the ice-berg regarding the problem of irrational prescribing. However, appraisal of such local data is essential in formulating remedial strategies. (12)

The increase in the quantities and variety of pharmaceuticals worldwide often leads to inappropriate use. This phenomenon often associated with health risk and economic burden to government since increase in the number of drugs available has incredible complicated the choice of appropriate drug for particular indications. The increase in the cost of drug is often linked to factors such as higher medical service utilization rates, irrational drug use as well as consumer behavioral aspects that lade to wastage. (17)

One study shows that globally more than 50% of all medicines are prescribed, dispensed or sold in appropriately, while 50% of patient's fail to take them correctively. (18)

The major health risk associated with the behavior of inappropriate or irrational pharmaceutical drug use by consumers is drug induced illness which can be avoided by better patient care. The mechanism that lied to drug induce illness are errors in dispensing or administration of drugs or poor compliance by the patient resulting In under use, over use, misuse or complete cession of the therapy that render patients complete cure. (19)

Unfortunately, in the real world, prescribing patterns do not always conform to these criteria & can be classified as inappropriate or irrational prescribing. Common patterns of irrational prescribing, may, therefore be manifested in the following forms: The use of drugs when no drug therapy is indicated, e.g., antibiotics for viral upper respiratory infections, The use of the wrong drug for a specific condition requiring drug

therapy, e.g., tetracycline in childhood diarrhea requiring ORS. The use of drugs with doubtful/unproven efficacy, e.g., the use of ant motility agents in acute diarrhea, The use of drugs of uncertain safety status, e.g., use of dipyrone ,Failure to provide available, safe, and effective drugs, e.g., failure to vaccinate against measles or tetanus, failure to Prescribe ORS for acute diarrhea, The use of correct drugs with incorrect administration, dosages, and duration, e.g., the use of IV metronidazole when suppositories or oral formulations would be appropriate. The use of unnecessarily expensive drugs, e.g. the use of a third generation broad spectrum antimicrobial when a first-line, narrow spectrum, agent is indicated. (21)

There are many different factors which affect the irrational use of drugs. In addition, different cultures view drugs in different ways, and this can affect the way drugs are used. The major forces can be categorized as those deriving from patients, prescribers, the workplace, the supply system including industry influences, regulation, drug information and misinformation, and combinations of these factors. (22)

The impact of irrational use of drugs can be seen in many ways: Reduction in the quality of drug therapy leading to increased morbidity and mortality, Waste of resources leading to reduced availability of other vital drugs and increased costs, Increased risk of unwanted affects such as adverse drug reactions and the emergence of drug resistance, e.g., malaria or multiple drug resistant tuberculosis, Psychosocial impacts, such as when patients come to believe that there is "a pill for every ill". This may cause an apparent increased demand for drugs (22)

### III. METHODS AND MATERIALS

#### a) *Study area and period*

The study was conducted from Feb 10 March 11 /2011 in selected public hospitals, Dansha, Adigrat, Ayder referral, lemlem Karl and kuha which are located in western, eastern and southern zones of Tigray regional state respectively. Tigray regional State is located to the northern extreme of the nation stretching approximately 120 -150 North and 35.30-40.30 East with an estimated area of 53.6 thousand square kilometers. It bordered from the North with Eritrea, in South with Amhara, from the East Afar, and from the West with Sudan. According to the new administrative set up, Tigray is divided in to 7 zones, 34 rural weredas, 12 municipalities and about 600 Tabias (the smaller administrative unit).

#### b) *Study design*

A cross sectional study was conducted in five selected public hospitals.

#### c) *Populations*

Source of population was all patients who came to the respective hospitals during study period, all

prescriptions and all health care providers in the respective hospitals and Study population was all clients who got the service at OPD department in study period and number of prescriptions which was prescribed by respective health professionals for the last one year, that is from September 2009-October 2010 and all out patient prescribers.

d) *Eligibility criteria*

Numbers of prescriptions that were prescribed in outpatient department, those patients treated at outpatient department and those prescribers in outpatient department were included in the study and all patients who are critically ill, unable to respond to the survey and under chronic care follow up like diabetics, tuberculosis and hypertensive patients were excluded from the study.

e) *Sampling Technique*

Total of 13 public hospitals found in the region were divided in three strata based on their status (referral, zonal and district). Simple random sampling method was used to select five hospitals from each category and each participant was selected using systemic random sampling methods.

f) *Sample Size determination*

i. *For Prescription Review*

Sampling size was determined using single population proportion formula,  $n = z^2p(1-p)/d^2$ , Where  $z = z$  value for 95% confidence interval = 1.96,  $P =$  estimated proportion of rational prescribing since there is not study done in this issue in the locality is taken as 50% to get maximum sample size.  $d =$  marginal error at 95% confidence level Therefore  $n = (1.96)^2(.5)(.5)/(.05)^2 = 384$ . Since the multi stage method was applied, design effect was considered. So the sample size was multiplied by 2 to account for design effect. Therefore the final sample size is  $384 \times 2 = 768$

The calculated sample size was allocated to each hospital proportionally, according to the number of patients seen in the outpatient department in the respective hospitals. Systematic random sampling technique was used to select prescriptions. By calculating sampling interval  $(K) = N/n$  where  $n =$  sample size and  $N =$  total number of the prescriptions (sampling frame). Accordingly, every  $K$ th prescription was selected for the study, but the first prescription was selected randomly.  $48000/768 = 1/62$  then every 62th prescription was selected from the sample frame

ii. *For the Patients Exit Interview*

Interview of patients was conducted to assess the rational drug use. In both hospitals since the study population is greater than 10000. Sampling size was determined Using single population proportion formula and sample size for the prescriptions was:  $n = z^2p(1-p)/d^2$ , Where  $z = z$  value for 95% confidence interval = 1.96  $p =$  estimated proportion which is 50%,  $d =$

confidence interval (marginal error) suppose we desire a 95% confidence level and + 5% precision. Therefore  $n = (1.96)^2(.5)(.5)/(.05)^2 = 384$ , 10% contingency was consider = 38.4, the total sample size was 422

Therefore the number of patients was selected from the study hospital by systematic sampling method according the proportion of patients they serve. Assuming those patients who had been served in the selected hospitals they have similar experience and exposure having the knowledge about drug use. Therefore they were not stratified and design effect was not considered.

g) *Variables*

*Study variables:* Socio demographic Characteristics (educational status, marital status, age sex), Average number of drugs per prescription, Percentage of drugs prescribed by generic name, Percentage of encounters with antibiotics, Percentage of drugs prescribed by injection, Number of drugs prescribed from EDL, Number of drugs properly labeled Dispensing time, Consultation time, Number of Patient's knowledge with adequate knowledge about their drugs usage Availability of facility formulary drug list, Presence of national treatment guide line at all out patient departments, Access to update drug information, Follow treatment guide line, Provision of information and instruction to patients

h) *Data collection instruments*

For patient interview standard structured questionnaire which was adapted from WHO core drug use indicators was designed to collect relevant data and check lists which was adapted from WHO also prepared targeted at prescribers, dispensers to review the prescriptions. The questionnaire were translated to Tigrigna and back translated to English.

i) *Pretesting the tools*

Pre testing the questionnaire were done prior to the actual data collection in a hospital different from the selected Hospitals on 5% of the calculated sample size to see the appropriateness, clarity of the questions, and the appropriateness of the orders. According to the pretest finding corrections were made.

j) *Data collectors' selection and training*

To collect data in addition to the principal investigator five pharmacy personnel and five BSC nurse were recruited for patient exit interview. Three supervisors also recruited to supervise the day today data collection activity. All data collectors were trained on the objectives of the study by the principal investigator then, separately pharmacy personnel's were again briefed on the prescribing indicators of the assessment tool and for those prescribers on dispensing indicators and patient drug use indicators assessment tool.



k) *Data Management and Analysis Procedures*

The collected data were submitted to the principal investigator on daily basis. The collected data were finally verified by the principal investigators for its completeness. Different mechanisms were applied to ensure data quality. These were: Data collection tools had been pre tested before the actual data collection started. And close supervision were conducted during the data collection period. The collected data were put in a secured place so that no one had access except the principal investigator.

Quantitative data collected by using the client exit interview, and prescriptions review were cleaned, coded and entered in to SPSS version 16 statistical package. Descriptive statistics had been computed and the results of the study presented by frequency tables, charts and graphs. X2 (chi square) tests were applied to assess variables any significant association between them. Besides, triangulations of data from different sources were done to obtain more valid result.

l) *Ethical considerations*

Ethical clearance was obtained from Jimma University PUBLIC Health and Medical Science Ethical Clearance Committee. Written letter were obtained from Jimma University. Tigray regional Health bureau wrote a support letter to the selected study Hospitals. Hospital Managers was contacted and permission secured. During data collection the purposes of the study were explained, their willingness to be interviewed was asked and informed verbal consent was obtained from

participants of the study. They were told that they can discontinue the interview at any time if they don't feel comfortable. Name and other identifiers of those patients and professionals interviewed were not being recorded on the questionnaires. The filled documents were archived properly to ensure confidentiality.

m) *Dissemination plan*

First the study result will be presented to Jimma University Public Health and Medical Faculty, after comments are incorporated, hard copies of the findings will be disseminated to Tigray regional health bureau, respective hospitals and to different organization that have a contribution on improving rational drug use in hospitals. It will also be presented in various seminars and workshops held in the region. And finally the study will be published in to reputable journals.

IV. RESULTS

a) *Socio demographic characteristics of respondents*

The main characteristics of patients attending in the outpatient department of the five hospitals are shown in the table 1. The percentage of male to female in all hospitals are 54.3 to 45.7 respectively. Male is predominance than female; educational status of the patients were 32% (illiterate), 25.8 % (attending elementary school), 22.3 % (attending secondary school), 13.7% (college certificate and diploma), 6.2% (first degree & above)

Table 1: Socio demographic characteristics of the respondents in selected public hospitals in Tigray regional state, Ethiopia February 2011(N= 422)

Variable	Category	Frequency	
		N	%
Age in year	15-19	104	24.6
	20-24	101	23.5
	25-29	61	14.5
	30-34	57	13.5
	35-39	40	9.5
	40-44	14	3.5
	45 and above	45	10.6
Sex	Male	229	54.3
	Female	193	45.7
Educational status	Illiterate	135	32
	Elementary	109	25.8
	Secondary	94	22.3
	College certificate and above	84	19.9
Marital status	Married	247	58.5
	Single	130	30.8
	Divorced and widowed	45	13.1

b) Patient knowledge on correct use of drugs

This study revealed that 240 (56.9 %) of patients didn't know for what disease the drug is prescribed. And only 46.2% of the patients know the dose of the drug they supposed to take. Most 354(83.9%) of patients know the frequency of use. Besides the above finding,

significant proportion of patients 171(40.5%) didn't know the duration of treatment. Although they are few in number, 8.3% of patients have misconceptions about sharing of drugs to other members of the family in case they are sick. See table2:

Table 2: Patient knowledge on drug use in selected public hospitals in Tigray regional state, Ethiopia February 2011

Variables	Category	Frequency	
		N	%
Knowledge of patients on use of drugs	Yes	182	43.1
	No	240	56.9
Knowledge of patients on dose of medications	Yes	195	46.2
	No	227	53.8
Knowledge of patients on frequency of use	yes	354	83.9
	No	68	16.1
Knowledge of patients with length of treatment	yes	251	59.5
	No	171	40.5
sharing medication to family or others	yes	34	8.1
	No	388	91.9
action will be taken for getting Excellency before the period of treatment is finished	Continue the medication	361	85.5
	Stop immediately	61	14.5
actions will be taken in the event of missing to take medication	Continue the rest	356	84.4
	Take the rest & the missing ones	63	14.9
	Stop immediately	3	0.7

c) Patient's knowledge on drug use disaggregated by hospitals

Percentage of patients having adequate knowledge on drug use in each hospital were analyzed

and listed in table 3. According the finding those patients who got the service in zonal hospitals have adequate knowledge were 34.24%, in district hospitals 26.2% and in referral hospital 43.5%

Table 3: Number of patients with adequate knowledge on drug use disaggregated by hospitals in selected public health hospitals in Tigray regional state, Ethiopia April2011

Hospital name		Number of patients with		Total
		Adequate knowledge on drug use	In adequate knowledge on drug use	
Lemlem Karl zonal hospital	No	21	71	92
	%	22.8	77.2	
Quha district hospital	No	12	30	42
	%	28.6	71.4	
Adigrat zonal hospital	No	42	50	92
	%	45.7	54.3	
Ayder referral hospital	No	67	87	154
	%	43.5	56.5	
Dansha district hospital	No	10	32	42
	%	23.8	76.2	
Total	No	152	270	422
	%	36.0	64.0	

d) *Consultation and dispensing time*

One of the patient care indicators are counseling time and dispensing time. This study found that on average 4.9 minutes are spent for consultation and 3.1 minutes for dispensing. When we see this indicator across level of Hospitals, referral hospitals has average time (4.9, 3.2 min) whereas district hospitals

(4.3,2.5 min) and zonal hospitals has(5.7,3.8 min) the higher average consultation and dispensing time is in zonal hospitals . The interview of patients revealed that only 115(26.3%) of them, the side effect of the drug was explained to them by the dispenser. Besides, similar number of patients responded that they got instruction on how to store the drugs. (See table)

Table 4: Counseling and dispensing time in selected public hospitals in Tigray regional state, Ethiopia February 2011

Variables	Over all	Referral hospital	Zonal hospital	District hospital
Dispensing time in minutes	3.1	3.2	3.8	2.5
Counseling time in minutes	4.9	4.9	5.7	4.3

e) *Drug Labeling*

Other patient care indicators were percentage of drugs adequately labeled; this is use full to measure the degree to which dispensers record essential information on the drugs package they dispense the result showed that 919 (77.8%) of the drugs were labeled by their generic name (69%) for the referral hospital, (65%) for zonal hospitals and (34.5%) for

district hospitals. The strength of the drugs was recorded in average 87.7% of the time. Moreover, dose of the drug was written only for 848(71.3%) of the drugs. Quantity of the drugs and frequency of use were written in 80.9% and 75.5% of the time respectively. However, only 99(11.4%) of the drugs have all the required labels. (See table5)

Table 5: Percentage of drugs labeled with essential information in selected public hospitals in Tigray regional state, Ethiopia February 2011

Variables	Overall		Referral hospital		Zonal hospital		District hospital	
	No	%	No	%	No	%	No	%
Generic name	919	77.8	380	69.5	428	65.7	100	34.5
Strength	1037	87.7	142	44.2	294	45.65	77	25.0
Dose	848	71.3	424	77.8	483	73.8	135	45.0
Quantity	956	80.9	451	82.5	555	84.75	189	64.3
Frequency of use	892	75.5	384	68.8	428	81.5	184	61.9
Patient name	177	14.9	38	10.4	147	22.3	34	10.5
Having all labels	99	11.7	46	14.2	40	12.3	13	9.0

f) *Average number of drugs per Encounter*

Prescribing indicators were analyzed in all the studied hospitals. A total of 768 encounters with 1324 drugs were prescribed. Average number of drugs per encounter over all the hospitals was 2. From the 1324 prescriptions reviewed, 958 (72.4%) of drugs prescribed by generic name in the studied hospitals.

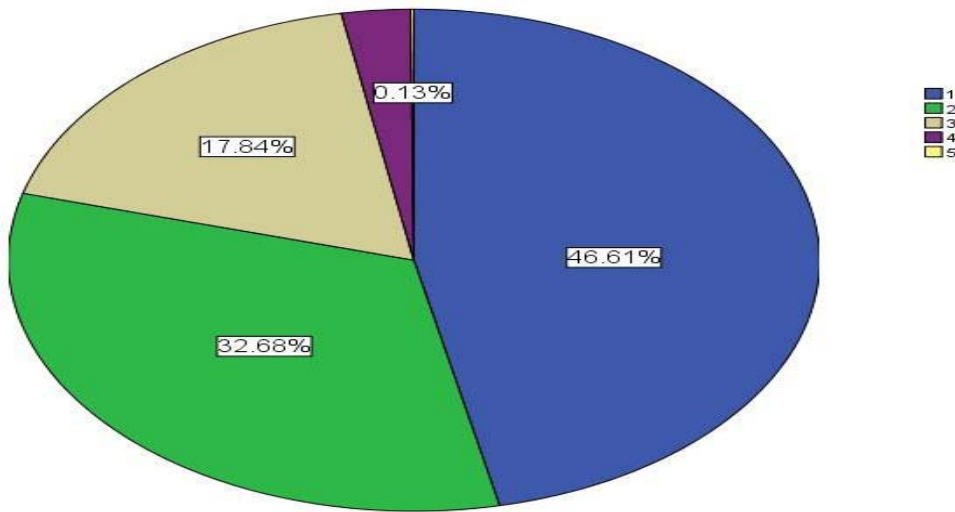


Fig. 4: Percentage of prescriptions with corresponding number of drugs in selected public hospitals in Tigray regional state, Ethiopia April 2011

g) *Percentage of drugs prescribed by generic name*

Percentage of drugs prescribed by generic name in the studied hospitals was in referral hospital 232(83.2%), zonal hospitals 419(77.65) and district hospitals 307(60.3) and in over all hospitals 958(72.4%)

were with no antibiotics prescribed. Prescriptions with antibiotics in referral hospitals 66(34.4%); Zonal hospitals 154(48.15%) and district hospitals were 128(49.9%) (Table 6).

h) *Percentage of antibiotics prescribed per encounter*

In this study percentage of antibiotics per encounter was 348(45.3) and 420(54.7) of prescriptions

Table 6: Percentage of prescriptions with one or more antibiotics in selected public hospitals in Tigray regional state Ethiopia, February 2011

Hospitals	With one or more antibiotics		With no injections	
	Frequency (N)	%	Frequency (N)	%
zonal hospitals (n=320)	154	48.8	166	51.2
District hospitals (n=256)	128	60.9	128	39.1
Referral hospital (n=192)	66	34.4	126	65.6
Total (n=768)	348	45.3	420	54.7

i) *Percentage of encounter with injections*

This study revealed that on average 123 (16%) of the prescriptions have at least one injections with the highest for zonal hospitals 70 (21.9%) and the lowest for

referral hospital 19 (9.9%) Prescriptions with one or more injections in over all the study were 123(16.0) (table 7).

Table 7: Prescriptions with one or more injections in selected hospitals in Tigray regional state, Ethiopia April 2011

Hospitals	With no injection		With one or more injections	
	Frequency	%	Frequency	%
zonal hospitals (n=320)	256	78.15	70	27.1
District hospitals (n=256)	222	60.9	34	26.6
Referral hospital (n=192)	173	90.1	19	9.9
Total (n =786)	645	84.0	123	16.0

j) *Percentage of drugs prescribed from FDL/EDL*

Percentage of drugs prescribed from EDL/FDL were in zonal hospital 525(97.3%), district hospitals 497(98.2%), referral 275 (98.5%). According to this study, number of drugs prescribed from EDL/FDL LKZH

254(100%), QDH 235(99.5%), and ADZH 271(100%), ARH 275(99.2 %), DDH262 (99.4%). The most commonly prescribed drugs were antibiotics 404(52.6%), antipyretics 337(43.9%), anti-protozoa 109(14.2%), anti-acid or anti-ulcer 84(10.9%),

electrolytes 60(7.8%), minerals and vitamins 57(7.4%), steroids 51(6.6%), antihistamine 29(3.8%), antiemetic 25(3.3%), antispasmodics 25(3.3%), anti-fungal 16 (2.1%), sympatolytics 14(1.8%) antiseptics 14(1.8), TAT (1%), diuretic s 10(1.3%) local anesthesia 2(0.3%).

k) *Availability of facility formulary drug list and Guideline*  
 All studied health facility except one of the district Hospital didn't have published facility drug formulary list but they have drug and therapeutic committee and national treatment guide line. In this

study in all the study area except one of the district hospital there is no treatment guide line at OPD.

l) *Prescribers who have an access to update drug information*

Prescribers who had an access to update their knowledge in drug prescribing and number of prescribers who follow national treatment guide line in Lemlem Karl, Quha, Adigrat, Ayder and Dansha were listed in (table 9).

Table 8: Facility based indicators in selected public hospitals in Tigray regional state, Ethiopia February 2011

Hospital name with number of prescribers	Follow treatment Guide line		Access to update drug knowledge	
	Yes	No	Yes	No
LemlemKarl (n=5)	4	1	4	1
Quha ( n =2)	0	2	0	2
Adigrat (n=5)	3	2	2	3
Ayder (n= 5)	4	1	5	0
Dansha (n= 3)	3	0	0	3

m) *Binary Logistic regression analysis result*  
 Binary Logistic regression analysis was done to check association between the different factors such as; socio-demographic characteristics of clients and consultation time, with adequate knowledge of patients were analyzed. It was revealed that educational status of

patients has statistically significant association with knowledge of patients about drugs use P value < 0.01 however age, sex, marital status was not significantly associated with knowledge of patients about drug use. In addition, consultation time and knowledge were not significantly associated.

Table 5: Association between educational statuses and adequate knowledge on drug use in selected public hospitals in Tigray regional state

Sr. No.	Variable	Category	AOR	P-value	95 % CI
1	Age	-	0.97	0.839	(0.731, 1.290)
2	Sex	Female	1		
		Male	0.952	0.86	(0.549, 1.651)
3	Educational level	<b>Illiterate</b>	<b>244</b>	<b>&lt;0.01</b>	<b>(29.41, 2030.6)**</b>
		Elementary	41	<0.01	(5.28, 328.37)
		<b>Secondary</b>	<b>23</b>	<b>0.002</b>	<b>(3.05, 186.55)**</b>
		First degree	1		
4	Marital status	Married	1		
		Single	1.054	0.873	(0.538, 2.067)
		Divorced	0.55	0.563	(0.73, 4.16)
		Widowed	1.497	0.603	(0.32, 6.84)
5	Dispensing time	-	<b>1.226</b>	<b>0.003</b>	<b>(1.073, 1.401)**</b>
6	Consultation time	-	0.984	0.889	(0.789, 1.229)

\*\* Variable that shows significant association at P-value<0.005

## V. DISCUSSION

This study tried to assess the rational drug use in selected Hospitals of Tigray Regional State. Data was collected from interviewing patients and reviewing prescriptions. Accordingly, the finding of this study showed that irrational prescribing is still a serious problem in the study area. Prescriptions with antibiotics in referral hospitals 66(34.4%); Zonal hospitals 154(48.15%) and district hospitals were 128(49.9%). The percentage of antibiotics per encounter is significantly

higher in district hospitals than the referral and zonal hospitals. This is may be due to the reason that in most of the district levels the prescribers were middle level professionals (nurses).

The overall prescriptions with antibiotics were 348(45.3%) and it is higher than what WHO recommended (<32%). Studies conducted in South Africa in public hospitals percentage of antibiotics per encounter were 68.1 % (1). Similar study was conducted in north west Ethiopian hospitals and west Nepal which was 25% and 28% respectively so; there was more

antibiotics usage in the studied area but better than Nigeria and Pakistan, the use of antibiotics was very high i.e. 75% and 78% respectively. This Irrational use of antibiotics contributes to increased antimicrobial resistance (AMR), rendering essential antibiotics ineffective and requiring the use of newer, more expensive antibiotics for the treatment of bacterial illnesses.

In the present study the average number of drugs per prescription were in zonal hospitals (1.65), District hospitals (1.95), Zonal hospitals (1.5), Referral Hospital (1.45). In overall situation the results are similar with the desired standard what the WHO recommended (<2) and better than the studies conducted in Western Nepal (2.5), Niger, (2.95), South Africa (3.2). The most commonly prescribed drugs in over all were antibiotics 348(45.3%), antipyretics 337(43.9%), anti- protozoa 109(14.2%), anti-acid or anti-ulcer 84(10.9%), electrolytes 60(7.8%), minerals and vitamins 57(7.4%), steroids 51(6.6%), antihistamine 29(3.8%), antiemetic 25(3.3%), antispasmodics 25(3.3%), anti-fungal 16 (2.1%), sympatholytic 14(1.8%) antiseptics 14(1.8), TAT 8(1%), diuretics 10(1.3%) local anesthesia 2(0.3%).

The percentage of drugs prescribed by generic name in referral hospitals 232(83.2%) Zonal hospital 419(77.65%), District hospitals 307 (60.3%) And the overall situation was 958(72.4%). in this study prescribed drugs by generic name among the hospitals level decreased from referral to district. Study conducted in North West Ethiopia Gonder hospital (72.6%) Debre tabor hospital (84%) Bahdar hospital (70.5%), South Africa (45.2%). The difference may be due to difference in settings and compositions. According to the WHO recommendation percentage of drugs prescribed by generic name should be 100%. In relation to this in the region there is low of generic use of drugs identified and the factors are needs further investigation. The percentage of drugs prescribed from EDL/FDL referral hospitals 275(98.5%) Zonal hospitals 525(97.3%) District hospital 497(98.2%), this shows there is a similarity among the studied hospitals and better than the study conducted in South Africa (92%) western Nepal (81.4%) Gonder hospital (92.2%), Bahrdar (81.4%), and Debretabor hospital (85%).

The percentage of injections per encounters were in referral hospitals 19(9.9%), zonal hospitals 70(27.1%) district hospital 34(26.6%), and the total number prescription with one or more injections were 123(16.0%). High number of injections was prescribed in zonal and district than referral hospitals. This may be because of the commonly and minimal disease that needs injection for reducing pains were common in district and zonal hospital than in referral. Overall result is greater than the other studies conducted in South Africa (8.3%), and less than the studies conducted in Niger (29.9%).

It was found only 11.7 of drugs were adequately labeled (name of the patient, drug name, dose and quantity). Other study conducted in India the value was 18.5%. Since the pharmacists are actively participating in dispensing of medication, their involvement in providing adequate information to the patient can be judged through this procedure, which was unfortunately found very low. Hence, this low rate of appropriate envelope labeling must be taken as a matter of concern.

In this study Number of patients with adequate knowledge (drug dosage frequency and length of treatment) on drug use was found to be 152(36%). Similar study revealed 52.8% in Chennai, India, 55% in Cambodia, 25.70% in Brazil 21%. At this point it is the duty and responsibility of pharmacist to provide adequate information on proper use of drug. From this study it is evident that the patient had adequate knowledge as compared to the other study. However, this does not assure that the drug will be correctly used by the patient because no follow up study was conducted.

Association between the different factors such as; socio demographic characteristics of clients and consultation time, with adequate knowledge of patients were analyzed. It was revealed that educational status of patients has significant statistical association with knowledge of patients about drugs use P value < 0.01. Those patients who had completed elementary school and secondary school had adequate knowledge 41,23 times less than the first degree and above respectively. However age, sex, marital status and was not significantly associated with knowledge of patients' p value > 0.05. Regarding to the patient care indicators the average dispensing and counseling time was (3.18 min), (2.46 min) respectively. This time is shorter than in India 3.7 and 3.1 minutes respectively and longer than in Nepal which was 52 seconds.

This dispensing time and counseling time is very low led to inadequate information about medication being given to the patients. Patients had little chance to obtain information about their treatment. In addition, most of the drugs dispensed were improperly labeled (11.7%) proper labeling). Dispensing is an essential element of rational drug use, since it is the last point of contact that patients have with their healthcare providers. All efforts and resources involved in patient because a pharmacist can hardly explain about the dosage regimen, any side effect of drug therapy and precautions to be taken along with appropriate labeling of envelope in such a short period of time. Also, as per the WHO recommendation the pharmacist should spend at least 5 minutes in dispensing & 10 min in orienting each patients.

Healthcare providers should be encouraged to comply with the Standard Therapeutic Guidelines in their day-to-day practice. Treatment guidelines have the strongest long-term impact if they are frequently

updated, widely distributed, integrated in the training of prescribers, and used for drug use review. Availability formulary drug list in the study areas were assessed and it was found that there is no published drug formulary list in the hospitals except in one district hospital (Dansha hospital). Standard treatment guide line at OPD level was not available except in two zonal hospitals. There is no drug information center in all the studied areas.

## VI. CONCLUSION AND RECOMMENDATION

### a) Conclusion

In conclusion, the finding of this study shows irrational prescribing and dispensing practice. Generic prescribing was remarkably lower 958 (72.4%), antibiotics 3489 (45.3%) and injections 123(16.0%) prescribed were considerably higher, appropriate labeling of envelope was surprisingly low. Rational Prescribing practice is better in referral hospitals than zonal and district hospitals.

The patient's knowledge on correct dosage was found to be 152(36%). Consultation and dispensing time was far from the desired standard (4.9, 3.1 min) respectively. Availability of formulary drug list in the facility and prescience of national treatment guide line at outpatient department were almost none. There is no way for updating drug information, in all the study area there is no drug information center. However Number of drug per prescriptions was similar to what recommended by WHO

### b) Recommendation

Rational use of medicines depends on the knowledge, attitudes and behaviors of prescribers, dispensers and patients. So, the region should give training in rational pharmacotherapy, linked to STGs and EMLs, & it can help to establish good prescribing habits. Communication skill is very important for dispensers dealing with patients or health care professionals to convey relevant drug information effectively and clearly, which can be done verbally and/or in written form. Therefore the health facility have relevant documents like national treat Treatment guide line and formulary drug list , avail the documents in every service area and they should established drug information center. Drug dispensers must have the ability to explain information clearly by the language particularly the patient or care provider can understand and check whether the information is being understood by them.

## ACKNOWLEDGMENTS

I am grateful thank to God the almighty for giving me health and availing me the strength and patience to complete this thesis. My appreciation and heartiest gratitude to my advisors Mr. YohannesEjigu and Dr. Jephi Herrin for their inspiring collective leadership, constructive and help full suggestions,

comments, advice and support throughout this study which greatly improved it and without them the study results would have be negligible.

In addition, my appreciation goes to my family, for their faithful help and their moral support. I would like to express my deep gratitude also to those who are involved in this study for their trust, participation, cooperation and for their valuable time they spent in providing information especially thanks to Mr. Kalayukidanu for his valuable assistance in the realization of this study.

## REFERENCES RÉFÉRENCES REFERENCIAS

1. Managing Drug Supply 2<sup>nd</sup> edition, MSH in collaboration with WHO p- 21/2007,
2. Saurav Ghimire,<sup>1</sup> Sushil Nepal,<sup>2</sup> Sushil Bhandari,<sup>3</sup> Prabha Nepal,<sup>4</sup> Subish Palaian<sup>5</sup> A prospective surveillance of drug prescribing and dispensing in a teaching hospital in Western Nepal Vol. 59, No. 10, October 2009
3. AmareMengistu\*, MD, PATTERNS OF DRUG UTILIZATION IN INPATIENT DEPARTMENTS, JIMMA HOSPITAL SOUTH WEST ETHIOPIA vol 15. No. 2 2005
4. SULTANATE OF OMAN, MINISTRY OF HEALTH THE DIRECTORATE GENERAL OF PHARMACEUTICAL AFFAIRS AND DRUG CONTROL, rational drug use may 2008 health Journal
5. Ross-Degnan, D, Laing, R.O., Quick, J,D., et al, Problems of Irrational Drug Use A Strategy for Promoting Improved Pharmaceutical Use: The International Network for Rational Use of Drugs, Social Science and Medicine, 1992, 35(11), 1329-1341
6. K.A. Bashrahil Indicators of rational drug use and health services in Hadramout, Yemen Eastern Mediterranean Health Journal 2009
7. Zeruesenay Desta<sup>1</sup>, TeferraAbula <sup>1</sup>, Asfawoseen Gebre-Yohannes<sup>2</sup>, Alemayehu Worku<sup>3</sup> Drug prescribing patterns for outpatients in three Hospitals in north-west Ethiopia 2004
8. A manual on drug and therapeutic committee a practical guide line, world health organization in collaboration with management science for health published in 2007
9. Dr. Sneha Ambwani\* Dr A K Mathur RATIONAL DRUG USE Health Administrator Vol: XIX Number 1: 5-7
10. Chanin Chareonkul<sup>1</sup>, VaLuong Khun<sup>2</sup> and Chaweewon Boonshuyar<sup>3</sup> RATIONAL DRUG USE IN CAMBODIA: STUDY OF THREE PILOT HEALTH CENTERS IN KAMPONG THOM PROVINCE.
11. Bharti SS<sup>1</sup>, Shinde M<sup>2</sup>, Nandeshwar S<sup>3</sup>, Tiwari SC<sup>4</sup> Pattern of prescribing practices in the Madhya Pradesh, India Kathmandu University Medical Journal (2008), Vol. 6, No. 1, Issue 21, 55-59.

12. TERNS OF DRUG UTILIZATION IN INPATIENT TAL SOUTH WEST ETHIOPIA vol 15. No. 2 2005
13. Teferabula, gizachewashagrie, assessment of drug utilization from dispensers and prescribers in selected towns of amhara region.
14. A manual on drug and therapeutic committee MSH 2009.
15. Federal ministry of health, Session Guide Problems of Irrational Drug use in Ethiopia 2008
16. Good Prescribing Manual for Ethiopia, Drug Administration and Control Authority of Ethiopia 2008
17. Access to and rational use of medicines at the facility level WHO and federal ministry of health Nigeria 2010
18. How to investigate drug use in health facilities WHO action programmes on essential drugs.
19. Saurav Ghimire,1 Sushil Nepal,2 Sushil Bhandari,3 Prabha Nepal,4 Subish Palaian5 A prospective surveillance of drug prescribing and dispensing in a teaching hospital in Western Nepal Vol. 59, No. 10, October 2009
20. G. Mohlala,1 K. Peltzer,1,2 N. Phaswana-Mafuya 1,3 and S. Ram lagan Drug prescription habits in public and private health facilities in 2 provinces in South Africa Eastern Mediterranean Health Journal Vol. 16 No. 3 • 2010
21. Bhartiy SS, Shinde M, Nandeshwar S, Tiwari SC Pattern of prescribing practices in the Madhya Pradesh, India Kathmandu University Medical Journal (2008), Vol. 6, No. 1, Issue 21, 55-59
22. Desta Z, Abula T, Beyene L, Fantahun M, Yohannes AG, Ayalew S Assessment of rational drug use and prescribing in primary health care facilities in North West Ethiopia.
23. Evaluation of prescription and rational use of drugs in Niger 2007
24. Saurav Ghimire,1 Sushil Nepal,2 Sushil Bhandari,3 Prabha Nepal,4 Subish Palaian5 A prospective surveillance of drug prescribing and dispensing in a teaching hospital in Western Nepal Vol. 59, No. 10, October 2009
25. Bhartiy SS1, Shinde M2, Nandeshwar S3, Tiwari SC4Pattern of prescribing practices in the Madhya Pradesh, India Kathmandu University Medical Journal (2008), Vol. 6, No. 1, Issue 21, 55-59
26. Fantahun M, Yohannes AG, Ayalew S Assessment of primary health care facilities in north west Ethiopia
27. Eastern Mediterranean journal n Improving rational drug use in Africa: the example of Sudan Volume 13 No. 5 September - October, 2007
28. Bhartiy SS1, Shinde M2, Nandeshwar S3, Tiwari SC4, Pattern of prescribing practices in the Madhya Pradesh, India Kathmandu University Medical Journal (2008), Vol. 6, No. 1, Issue 21, 55-59.
29. G. Mohlala,1 K. Peltzer,1,2 N. Phaswana-Mafuya 1,3 and S. Ram lagan Drug prescription habits in public and private health facilities in 2 provinces in South Africa Eastern Mediterranean Health Journal Vol. 16 No. 3 • 2010
30. Zeruesenay Desta1, TeferraAbula 1, Asfawoseen Gebre-Yohannes2, Alemayehu Worku3 Drug prescribing patterns for outpatients in three Hospitals in north-west Ethiopia 2008.



# GLOBAL JOURNALS GUIDELINES HANDBOOK 2018

---

[WWW.GLOBALJOURNALS.ORG](http://WWW.GLOBALJOURNALS.ORG)

# FELLOWS

## FELLOW OF ASSOCIATION OF RESEARCH SOCIETY IN MEDICAL (FARSM)

Global Journals Incorporate (USA) is accredited by Open Association of Research Society (OARS), U.S.A and in turn, awards "FARSM" title to individuals. The 'FARSM' title is accorded to a selected professional after the approval of the Editor-in-Chief/Editorial Board Members/Dean.



- The "FARSM" is a dignified title which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., FARSS or William Walldroff, M.S., FARSM.

FARSM accrediting is an honor. It authenticates your research activities. After recognition as FARSM, you can add 'FARSM' title with your name as you use this recognition as additional suffix to your status. This will definitely enhance and add more value and reputation to your name. You may use it on your professional Counseling Materials such as CV, Resume, and Visiting Card etc.

*The following benefits can be availed by you only for next three years from the date of certification:*



FARSM designated members are entitled to avail a 40% discount while publishing their research papers (of a single author) with Global Journals Incorporation (USA), if the same is accepted by Editorial Board/Peer Reviewers. If you are a main author or co-author in case of multiple authors, you will be entitled to avail discount of 10%.

Once FARSM title is accorded, the Fellow is authorized to organize a symposium/seminar/conference on behalf of Global Journal Incorporation (USA). The Fellow can also participate in conference/seminar/symposium organized by another institution as representative of Global Journal. In both the cases, it is mandatory for him to discuss with us and obtain our consent.



You may join as member of the Editorial Board of Global Journals Incorporation (USA) after successful completion of three years as Fellow and as Peer Reviewer. In addition, it is also desirable that you should organize seminar/symposium/conference at least once.

We shall provide you intimation regarding launching of e-version of journal of your stream time to time. This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.





The FARSM can go through standards of OARS. You can also play vital role if you have any suggestions so that proper amendment can take place to improve the same for the benefit of entire research community.

As FARSM, you will be given a renowned, secure and free professional email address with 100 GB of space e.g. [johnhall@globaljournals.org](mailto:johnhall@globaljournals.org). This will include Webmail, Spam Assassin, Email Forwarders, Auto-Responders, Email Delivery Route tracing, etc.



The FARSM will be eligible for a free application of standardization of their researches. Standardization of research will be subject to acceptability within stipulated norms as the next step after publishing in a journal. We shall depute a team of specialized research professionals who will render their services for elevating your researches to next higher level, which is worldwide open standardization.

The FARSM member can apply for grading and certification of standards of their educational and Institutional Degrees to Open Association of Research, Society U.S.A. Once you are designated as FARSM, you may send us a scanned copy of all of your credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria. After certification of all your credentials by OARS, they will be published on your Fellow Profile link on website <https://associationofresearch.org> which will be helpful to upgrade the dignity.



The FARSM members can avail the benefits of free research podcasting in Global Research Radio with their research documents. After publishing the work, (including published elsewhere worldwide with proper authorization) you can upload your research paper with your recorded voice or you can utilize chargeable services of our professional RJs to record your paper in their voice on request.



The FARSM member also entitled to get the benefits of free research podcasting of their research documents through video clips. We can also streamline your conference videos and display your slides/ online slides and online research video clips at reasonable charges, on request.





The FARSM is eligible to earn from sales proceeds of his/her researches/reference/review Books or literature, while publishing with Global Journals. The FARSS can decide whether he/she would like to publish his/her research in a closed manner. In this case, whenever readers purchase that individual research paper for reading, maximum 60% of its profit earned as royalty by Global Journals, will be credited to his/her bank account. The entire entitled amount will be credited to his/her bank account exceeding limit of minimum fixed balance. There is no minimum time limit for collection. The FARSM member can decide its price and we can help in making the right decision.

The FARSM member is eligible to join as a paid peer reviewer at Global Journals Incorporation (USA) and can get remuneration of 15% of author fees, taken from the author of a respective paper. After reviewing 5 or more papers you can request to transfer the amount to your bank account.



## MEMBER OF ASSOCIATION OF RESEARCH SOCIETY IN MEDICAL (MARSM)

The ' MARSM ' title is accorded to a selected professional after the approval of the Editor-in-Chief / Editorial Board Members/Dean.

The “MARSM” is a dignified ornament which is accorded to a person’s name viz. Dr. John E. Hall, Ph.D., MARSM or William Walldroff, M.S., MARSM.



MARSM accrediting is an honor. It authenticates your research activities. After becoming MARSM, you can add 'MARSM' title with your name as you use this recognition as additional suffix to your status. This will definitely enhance and add more value and repute to your name. You may use it on your professional Counseling Materials such as CV, Resume, Visiting Card and Name Plate etc.

*The following benefits can be availed by you only for next three years from the date of certification.*



MARSM designated members are entitled to avail a 25% discount while publishing their research papers (of a single author) in Global Journals Inc., if the same is accepted by our Editorial Board and Peer Reviewers. If you are a main author or co-author of a group of authors, you will get discount of 10%.

As MARSM, you will be given a renowned, secure and free professional email address with 30 GB of space e.g. [johnhall@globaljournals.org](mailto:johnhall@globaljournals.org). This will include Webmail, Spam Assassin, Email Forwarders, Auto-Responders, Email Delivery Route tracing, etc.





We shall provide you intimation regarding launching of e-version of journal of your stream time to time. This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.



The MARS member can apply for approval, grading and certification of standards of their educational and Institutional Degrees to Open Association of Research, Society U.S.A.



Once you are designated as MARS, you may send us a scanned copy of all of your credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria.

It is mandatory to read all terms and conditions carefully.



## AUXILIARY MEMBERSHIPS

### Institutional Fellow of Open Association of Research Society (USA) - OARS (USA)

Global Journals Incorporation (USA) is accredited by Open Association of Research Society, U.S.A (OARS) and in turn, affiliates research institutions as “Institutional Fellow of Open Association of Research Society” (IFOARS).



The “FARSC” is a dignified title which is accorded to a person’s name viz. Dr. John E. Hall, Ph.D., FARSC or William Walldroff, M.S., FARSC.

The IFOARS institution is entitled to form a Board comprised of one Chairperson and three to five board members preferably from different streams. The Board will be recognized as “Institutional Board of Open Association of Research Society”-(IBOARS).

*The Institute will be entitled to following benefits:*



The IBOARS can initially review research papers of their institute and recommend them to publish with respective journal of Global Journals. It can also review the papers of other institutions after obtaining our consent. The second review will be done by peer reviewer of Global Journals Incorporation (USA) The Board is at liberty to appoint a peer reviewer with the approval of chairperson after consulting us.

The author fees of such paper may be waived off up to 40%.

The Global Journals Incorporation (USA) at its discretion can also refer double blind peer reviewed paper at their end to the board for the verification and to get recommendation for final stage of acceptance of publication.



The IBOARS can organize symposium/seminar/conference in their country on behalf of Global Journals Incorporation (USA)-OARS (USA). The terms and conditions can be discussed separately.

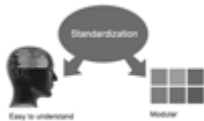
The Board can also play vital role by exploring and giving valuable suggestions regarding the Standards of “Open Association of Research Society, U.S.A (OARS)” so that proper amendment can take place for the benefit of entire research community. We shall provide details of particular standard only on receipt of request from the Board.



The board members can also join us as Individual Fellow with 40% discount on total fees applicable to Individual Fellow. They will be entitled to avail all the benefits as declared. Please visit Individual Fellow-sub menu of GlobalJournals.org to have more relevant details.



We shall provide you intimation regarding launching of e-version of journal of your stream time to time. This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.



After nomination of your institution as “Institutional Fellow” and constantly functioning successfully for one year, we can consider giving recognition to your institute to function as Regional/Zonal office on our behalf. The board can also take up the additional allied activities for betterment after our consultation.

**The following entitlements are applicable to individual Fellows:**

Open Association of Research Society, U.S.A (OARS) By-laws states that an individual Fellow may use the designations as applicable, or the corresponding initials. The Credentials of individual Fellow and Associate designations signify that the individual has gained knowledge of the fundamental concepts. One is magnanimous and proficient in an expertise course covering the professional code of conduct, and follows recognized standards of practice.



Open Association of Research Society (US)/ Global Journals Incorporation (USA), as described in Corporate Statements, are educational, research publishing and professional membership organizations. Achieving our individual Fellow or Associate status is based mainly on meeting stated educational research requirements.

Disbursement of 40% Royalty earned through Global Journals : Researcher = 50%, Peer Reviewer = 37.50%, Institution = 12.50% E.g. Out of 40%, the 20% benefit should be passed on to researcher, 15 % benefit towards remuneration should be given to a reviewer and remaining 5% is to be retained by the institution.



We shall provide print version of 12 issues of any three journals [as per your requirement] out of our 38 journals worth \$ 2376 USD.

**Other:**

**The individual Fellow and Associate designations accredited by Open Association of Research Society (US) credentials signify guarantees following achievements:**

- The professional accredited with Fellow honor, is entitled to various benefits viz. name, fame, honor, regular flow of income, secured bright future, social status etc.



- In addition to above, if one is single author, then entitled to 40% discount on publishing research paper and can get 10% discount if one is co-author or main author among group of authors.
- The Fellow can organize symposium/seminar/conference on behalf of Global Journals Incorporation (USA) and he/she can also attend the same organized by other institutes on behalf of Global Journals.
- The Fellow can become member of Editorial Board Member after completing 3yrs.
- The Fellow can earn 60% of sales proceeds from the sale of reference/review books/literature/publishing of research paper.
- Fellow can also join as paid peer reviewer and earn 15% remuneration of author charges and can also get an opportunity to join as member of the Editorial Board of Global Journals Incorporation (USA)
- • This individual has learned the basic methods of applying those concepts and techniques to common challenging situations. This individual has further demonstrated an in-depth understanding of the application of suitable techniques to a particular area of research practice.

**Note :**

//

- In future, if the board feels the necessity to change any board member, the same can be done with the consent of the chairperson along with anyone board member without our approval.
- In case, the chairperson needs to be replaced then consent of 2/3rd board members are required and they are also required to jointly pass the resolution copy of which should be sent to us. In such case, it will be compulsory to obtain our approval before replacement.
- In case of “Difference of Opinion [if any]” among the Board members, our decision will be final and binding to everyone.

//





# PREFERRED AUTHOR GUIDELINES

## **We accept the manuscript submissions in any standard (generic) format.**

We typeset manuscripts using advanced typesetting tools like Adobe In Design, CorelDraw, TeXnicCenter, and TeXStudio. We usually recommend authors submit their research using any standard format they are comfortable with, and let Global Journals do the rest.

Alternatively, you can download our basic template from <https://globaljournals.org/Template>

Authors should submit their complete paper/article, including text illustrations, graphics, conclusions, artwork, and tables. Authors who are not able to submit manuscript using the form above can email the manuscript department at [submit@globaljournals.org](mailto:submit@globaljournals.org) or get in touch with [chiefeditor@globaljournals.org](mailto:chiefeditor@globaljournals.org) if they wish to send the abstract before submission.

## BEFORE AND DURING SUBMISSION

Authors must ensure the information provided during the submission of a paper is authentic. Please go through the following checklist before submitting:

1. Authors must go through the complete author guideline and understand and *agree to Global Journals' ethics and code of conduct*, along with author responsibilities.
2. Authors must accept the privacy policy, terms, and conditions of Global Journals.
3. Ensure corresponding author's email address and postal address are accurate and reachable.
4. Manuscript to be submitted must include keywords, an abstract, a paper title, co-author(s') names and details (email address, name, phone number, and institution), figures and illustrations in vector format including appropriate captions, tables, including titles and footnotes, a conclusion, results, acknowledgments and references.
5. Authors should submit paper in a ZIP archive if any supplementary files are required along with the paper.
6. Proper permissions must be acquired for the use of any copyrighted material.
7. Manuscript submitted *must not have been submitted or published elsewhere* and all authors must be aware of the submission.

## **Declaration of Conflicts of Interest**

It is required for authors to declare all financial, institutional, and personal relationships with other individuals and organizations that could influence (bias) their research.

## POLICY ON PLAGIARISM

Plagiarism is not acceptable in Global Journals submissions at all.

Plagiarized content will not be considered for publication. We reserve the right to inform authors' institutions about plagiarism detected either before or after publication. If plagiarism is identified, we will follow COPE guidelines:

Authors are solely responsible for all the plagiarism that is found. The author must not fabricate, falsify or plagiarize existing research data. The following, if copied, will be considered plagiarism:

- Words (language)
- Ideas
- Findings
- Writings
- Diagrams
- Graphs
- Illustrations
- Lectures



- Printed material
- Graphic representations
- Computer programs
- Electronic material
- Any other original work

## AUTHORSHIP POLICIES

Global Journals follows the definition of authorship set up by the Open Association of Research Society, USA. According to its guidelines, authorship criteria must be based on:

1. Substantial contributions to the conception and acquisition of data, analysis, and interpretation of findings.
2. Drafting the paper and revising it critically regarding important academic content.
3. Final approval of the version of the paper to be published.

### Changes in Authorship

The corresponding author should mention the name and complete details of all co-authors during submission and in manuscript. We support addition, rearrangement, manipulation, and deletions in authors list till the early view publication of the journal. We expect that corresponding author will notify all co-authors of submission. We follow COPE guidelines for changes in authorship.

### Copyright

During submission of the manuscript, the author is confirming an exclusive license agreement with Global Journals which gives Global Journals the authority to reproduce, reuse, and republish authors' research. We also believe in flexible copyright terms where copyright may remain with authors/employers/institutions as well. Contact your editor after acceptance to choose your copyright policy. You may follow this form for copyright transfers.

### Appealing Decisions

Unless specified in the notification, the Editorial Board's decision on publication of the paper is final and cannot be appealed before making the major change in the manuscript.

### Acknowledgments

Contributors to the research other than authors credited should be mentioned in Acknowledgments. The source of funding for the research can be included. Suppliers of resources may be mentioned along with their addresses.

### Declaration of funding sources

Global Journals is in partnership with various universities, laboratories, and other institutions worldwide in the research domain. Authors are requested to disclose their source of funding during every stage of their research, such as making analysis, performing laboratory operations, computing data, and using institutional resources, from writing an article to its submission. This will also help authors to get reimbursements by requesting an open access publication letter from Global Journals and submitting to the respective funding source.

## PREPARING YOUR MANUSCRIPT

Authors can submit papers and articles in an acceptable file format: MS Word (doc, docx), LaTeX (.tex, .zip or .rar including all of your files), Adobe PDF (.pdf), rich text format (.rtf), simple text document (.txt), Open Document Text (.odt), and Apple Pages (.pages). Our professional layout editors will format the entire paper according to our official guidelines. This is one of the highlights of publishing with Global Journals—authors should not be concerned about the formatting of their paper. Global Journals accepts articles and manuscripts in every major language, be it Spanish, Chinese, Japanese, Portuguese, Russian, French, German, Dutch, Italian, Greek, or any other national language, but the title, subtitle, and abstract should be in English. This will facilitate indexing and the pre-peer review process.

The following is the official style and template developed for publication of a research paper. Authors are not required to follow this style during the submission of the paper. It is just for reference purposes.



### ***Manuscript Style Instruction (Optional)***

- Microsoft Word Document Setting Instructions.
- Font type of all text should be Swis721 Lt BT.
- Page size: 8.27" x 11", left margin: 0.65, right margin: 0.65, bottom margin: 0.75.
- Paper title should be in one column of font size 24.
- Author name in font size of 11 in one column.
- Abstract: font size 9 with the word "Abstract" in bold italics.
- Main text: font size 10 with two justified columns.
- Two columns with equal column width of 3.38 and spacing of 0.2.
- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
- Line spacing of 1 pt.
- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
- The names of second main headings (Heading 2) must not include numbers and must be in italics with a font size of 10.

### ***Structure and Format of Manuscript***

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

- a) A title which should be relevant to the theme of the paper.
- b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
- c) Up to 10 keywords that precisely identify the paper's subject, purpose, and focus.
- d) An introduction, giving fundamental background objectives.
- e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
- f) Results which should be presented concisely by well-designed tables and figures.
- g) Suitable statistical data should also be given.
- h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

- i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
- j) There should be brief acknowledgments.
- k) There ought to be references in the conventional format. Global Journals recommends APA format.

Authors should carefully consider the preparation of papers to ensure that they communicate effectively. Papers are much more likely to be accepted if they are carefully designed and laid out, contain few or no errors, are summarizing, and follow instructions. They will also be published with much fewer delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and suggestions to improve brevity.

## FORMAT STRUCTURE

***It is necessary that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.***

All manuscripts submitted to Global Journals should include:

### **Title**

The title page must carry an informative title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) where the work was carried out.

### **Author details**

The full postal address of any related author(s) must be specified.

### **Abstract**

The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

Many researchers searching for information online will use search engines such as Google, Yahoo or others. By optimizing your paper for search engines, you will amplify the chance of someone finding it. In turn, this will make it more likely to be viewed and cited in further works. Global Journals has compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

### **Keywords**

A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in a research paper?" Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

### **Numerical Methods**

Numerical methods used should be transparent and, where appropriate, supported by references.

### **Abbreviations**

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

### **Formulas and equations**

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

### **Tables, Figures, and Figure Legends**

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.



## Figures

Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

### PREPARATION OF ELETRONIC FIGURES FOR PUBLICATION

Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/ photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution at final image size ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs): >350 dpi; figures containing both halftone and line images: >650 dpi.

Color charges: Authors are advised to pay the full cost for the reproduction of their color artwork. Hence, please note that if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a Color Work Agreement form before your paper can be published. Also, you can email your editor to remove the color fee after acceptance of the paper.

### TIPS FOR WRITING A GOOD QUALITY MEDICAL RESEARCH PAPER

**1. Choosing the topic:** In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

**2. Think like evaluators:** If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

**3. Ask your guides:** If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

**4. Use of computer is recommended:** As you are doing research in the field of medical research then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

**5. Use the internet for help:** An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.



**6. Bookmarks are useful:** When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

**7. Revise what you wrote:** When you write anything, always read it, summarize it, and then finalize it.

**8. Make every effort:** Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

**9. Produce good diagrams of your own:** Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

**10. Use proper verb tense:** Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

**11. Pick a good study spot:** Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

**12. Know what you know:** Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

**13. Use good grammar:** Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

**14. Arrangement of information:** Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

**15. Never start at the last minute:** Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

**16. Multitasking in research is not good:** Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

**17. Never copy others' work:** Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

**18. Go to seminars:** Attend seminars if the topic is relevant to your research area. Utilize all your resources.

**19. Refresh your mind after intervals:** Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.



**20. Think technically:** Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

**21. Adding unnecessary information:** Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

**22. Report concluded results:** Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

**23. Upon conclusion:** Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium through which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

## INFORMAL GUIDELINES OF RESEARCH PAPER WRITING

### **Key points to remember:**

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

### **Final points:**

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

*The introduction:* This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

### **The discussion section:**

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

### **General style:**

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

**To make a paper clear:** Adhere to recommended page limits.



### *Mistakes to avoid:*

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

### **Title page:**

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

**Abstract:** This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

*Reason for writing the article—theory, overall issue, purpose.*

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

### **Approach:**

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

### **Introduction:**

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.





*The following approach can create a valuable beginning:*

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

#### **Approach:**

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

#### **Procedures (methods and materials):**

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

#### **Materials:**

*Materials may be reported in part of a section or else they may be recognized along with your measures.*

#### **Methods:**

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

#### **Approach:**

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

#### **What to keep away from:**

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.



**Results:**

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

**Content:**

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

**What to stay away from:**

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

**Approach:**

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

**Figures and tables:**

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

**Discussion:**

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."



Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

**Approach:**

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

## THE ADMINISTRATION RULES

Administration Rules to Be Strictly Followed before Submitting Your Research Paper to Global Journals Inc.

*Please read the following rules and regulations carefully before submitting your research paper to Global Journals Inc. to avoid rejection.*

*Segment draft and final research paper:* You have to strictly follow the template of a research paper, failing which your paper may get rejected. You are expected to write each part of the paper wholly on your own. The peer reviewers need to identify your own perspective of the concepts in your own terms. Please do not extract straight from any other source, and do not rephrase someone else's analysis. Do not allow anyone else to proofread your manuscript.

*Written material:* You may discuss this with your guides and key sources. Do not copy anyone else's paper, even if this is only imitation, otherwise it will be rejected on the grounds of plagiarism, which is illegal. Various methods to avoid plagiarism are strictly applied by us to every paper, and, if found guilty, you may be blacklisted, which could affect your career adversely. To guard yourself and others from possible illegal use, please do not permit anyone to use or even read your paper and file.



CRITERION FOR GRADING A RESEARCH PAPER (COMPILATION)  
BY GLOBAL JOURNALS

Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals.

Topics	Grades		
	A-B	C-D	E-F
<i>Abstract</i>	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
<i>Introduction</i>	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
<i>Methods and Procedures</i>	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
<i>Result</i>	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
<i>Discussion</i>	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
<i>References</i>	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring



# INDEX

---

---

## **A**

Absorption · 35, 38  
Acquisition · 33  
Adolescent · 33

---

## **B**

Bladder · 12, 22, 23, 24

---

## **C**

Conceived · 9

---

## **D**

Descriptive · 1  
Determining · 27  
Diabolical · 14  
Dichotomous · 32  
Dumpsite · 6, 8

---

## **E**

Emptying · 1, 6, 8  
Epidemiology · 18, 24  
Essential · 5, 30

---

## **H**

Hematuria · 16, 18, 24

---

## **K**

Kapsabet · 1, 3, 6, 7, 8, 9

---

## **M**

Metastatic · 15  
Mitochondrial · 41  
Moderate · 6, 7  
Molecule · 35, 38, 40

---

## **N**

Neoplasms · 23, 24

---

## **P**

Pharmaceutical · 2  
Predominant · 12, 18  
Prognosis · 12  
Pterostilbene · 35

---

## **R**

Recurrence · 12, 14, 15, 17, 18, 21, 22  
Resveratrol · 35, 40

---

## **S**

Segregation · 1, 2  
Sprouted · 35, 38

---

## **U**

Urothelial · 22, 23, 24, 25



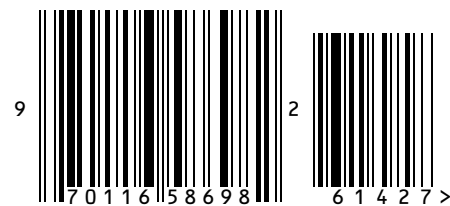
save our planet



# Global Journal of Medical Research

Visit us on the Web at [www.GlobalJournals.org](http://www.GlobalJournals.org) | [www.MedicalResearchJournal.org](http://www.MedicalResearchJournal.org)  
or email us at [helpdesk@globaljournals.org](mailto:helpdesk@globaljournals.org)

ISSN 9755896



© Global Journals